INDEX

SECTION A.—PHYSICS

1938

KEY

TO

SUBJECT INDEX.

The Domain of Physics is divided into eight Main Classes (*e.g.*, **GENERAL PHYSICS**). Each of these Classes is, in general, divided into a number of Sections, the titles of which are known as Key-Headings (*e.g.*, **Elasticity and Plasticity**), and these Sections are in turn divided into Sub-Sections under titles known as Sub-Headings (*e.g.*, " Photoelasticity "). The Key-Headings are given below arranged in alphabetical order in their Classes, and the scheme of Sub-Headings adopted is indicated in the remainder of the Key.

In the Subject Index these Key-Headings are arranged in alphabetical order throughout the whole Index.

The general form of entry of a paper consists of its full Title, the Author's Name and the Abstract Number assigned to the paper, the sequence of the entries under any Sub-Heading being the order of publication of the Abstracts as indicated by their Abstract Numbers.

Papers on **Apparatus and Instruments** are classified, in alphabetical order, in a **Supplementary Index** which immediately follows the SUBJECT INDEX.

Papers dealing with related subjects, of which Abstracts are given in Section B, Electrical Engineering, are included in the "Unclassified" Sub-Section at the end of each Key-Heading.

GENERAL PHYSICS.

Adsorption (See Surface Properties).
Atomic and Molecular Structure.
Colloids.
Crystal Structure and Special Properties.
Density.
Diffusion and Osmosis.
Elasticity and Plasticity.
Gravitation.
Hydrodynamics and Aerodynamics.
Kinetic Theory of Matter.
Length, Area and Volume.
Mass.
Mathematical Methods and Theory of Measurements.
Mechanics, Classical.
Mechanics, Quantum.
Philosophy of Scientific Method.
Pressure.
Relativity and Ether.
Solution.
Surface Properties.
Time.
Viscosity and Friction.

ASTRONOMY AND ASTROPHYSICS.

Astronomical Apparatus and Observatory Equipment.
Comets and Meteors.
Cosmogony.
Dynamical Problems (Astronomical).
Latitude and Longitude.
Nebulæ.
Planets.
Stars.
Sun.
Zodiacal Light and Gegenschein.

GEOPHYSICS.

Geodesy.
Geophysics, Applied.
Hydrosphere, Physics of the.
Land, Physics of the.
Meteorology.
Seismology.
Terrestrial Electricity and Magnetism.

RADIOACTIVITY.

All Abstracts relating to this subject are indexed under Radioactivity.

RADIATION.

Absorption.
Colorimetry.
Electro-Optical and Magneto-Optical Effects.
Emission.
Fluorescence and Phosphorescence. Luminescence and Afterglow.
Interference, Diffraction and Scattering.
Photochemistry (including Photography).
Photometry.
Polarisation.
Reflection, Refraction and Dispersion.
Spectroscopy.
Transmission.
Vision.
X-Rays.

HEAT.

Calorimetry.
Conduction.
Convection.
Dilatation.
Fusion and Solidification.
Temperature.
Thermochemistry.
Thermodynamics.
Vaporisation and Condensation.

ACOUSTICS.

All Abstracts relating to this subject are indexed under Acoustics.

ELECTRICITY AND MAGNETISM.

Alternating-Current Networks.
Conduction and Discharge in Gases.
Conduction in Solids and Liquids.
Dielectrics and Capacitance.
Electrochemistry.
Electrons, Neutrons, Positrons and Protons.
Electrostatics.
Galvanomagnetic and Thermomagnetic Effects.
Magnetism and Electromagnetism.
Medical Radiology and Electrology.
Oscillations and Waves.
Photoelectricity.
Piezoelectricity.
Thermionics.
Thermoelectricity.

KEY-HEADINGS WITH SUB-HEADINGS.

Absorption (Radiation). Page 1195.

1. Visible Region.
2. Infra-Red Region.
3. Ultra-Violet Region.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
- Absorption Spectra, *see* Spectroscopy.
- Cosmic Rays, *see* Emission (Radiation).
- Diathermancy, *see* Transmission (Radiation).

Cross-References (contd.) :
- Dichroism, *see* Polarisation (Radiation).
- Electric Waves, *see* Oscillations and Waves, Electric.
- γ-Rays, *see* Radioactivity.
- Meteorological Optics, *see* Meteorology.
- Visibility, *see* Meteorology, *also* Vision.
- X-Ray Absorption, *see* X-Rays.

Acoustics. Page 1195.

1. Theory of Waves and Vibrations.
2. Plates, Rods and Membranes.
3. Vibrating Columns of Air or other Gases.
4. Strings.
5. Velocity, Measurement of.
6. Propagation in the Atmosphere.
7. Supersonic Vibrations.
8. Architectural Acoustics.
9. Receivers and Reproducers.
10. Speech and Hearing. Noise.
11. Measurements of Absorption, Amplitude, Intensity, Frequency, Wave-Form, Radiation Pressure.
12. Apparatus, *see* Supplementary Index.
13. Unclassified.

Cross References :
- Architectural Acoustics, Noise, Receivers and Reproducers, *see also* Section B.—Electrical Engineering.

Adsorption.

(*see* Surface Properties.)

Alternating-Current Networks. Page 1200.

1. Circuit Theory.
2. A.C. Bridges, Applications of.
3. H.F. Measurements (*see also* Dielectrics and Capacitance).
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-Reference :
- Frequency, *see also* Oscillations and Waves, Electric.

Astronomical Apparatus and Observatory Equipment.

(*see* Supplementary Index.)

Atomic and Molecular Structure. Page 1201.

1. Nuclear Constitution (*see also* Electrons, etc., *and* Radioactivity).
2. Isotopes and Isobares.
3. Periodic System.
4. Valency.
5. Molecular Structure (*see also* Spectroscopy).
6. Allotropy.
7. Association.
8. Atomic and Molecular Magnitudes.
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References :
- Artificial Disintegration, *see* Radioactivity.

Cross-References (contd.) :
- Atomic and Molecular Rays, *see* Kinetic Theory of Matter.
- Atomic and Molecular States and Vibrations, *see* Spectroscopy.
- Critical Potentials, *see* Conduction (Electric) and Discharge in Gases.
- Dipole Moments and Molecular Polarisation, *see* Dielectrics and Capacitance.
- Liquid Structure, *see* Crystal Structure and Special Properties.
- Nuclear Moments, *see* Spectroscopy.

Calorimetry. Page 1207.

1. Specific Heat :
   - (*a*) Gases.
   - (*b*) Liquids.
   - (*c*) Solids.
2. Latent Heat :
   - (*a*) Fusion.
   - (*b*) Evaporation.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References :
- Heat of Adsorption, *see* Surface Properties.
- Heat of Combustion, Formation, Dissociation, Solution and Dilution, *see* Thermochemistry.
- Thermodynamics of Specific Heat and Latent Heat, *see* Thermodynamics.

Colloids. Page 1209.

1. Theory.
2. Sols :
    - (*a*) Formation and Composition.
    - (*b*) Optical Properties.
    - (*c*) Viscosity and Mechanical Properties.
3. Gels :
    - (*a*) Formation and Composition.
    - (*b*) Optical Properties.
    - (*c*) Viscosity and Mechanical Properties.
    - (*d*) Swelling, Shrinking, Synæresis.
    - (*e*) Membranes.
4. Fibres.
5. Emulsions and Suspensions.
6. Electrical Properties (Coagulation, Kataphoresis, Electroosmosis, etc.).
7. Structure.
8. Apparatus, *see* Supplementary Index.
9. Unclassified.

Cross-References :
Brownian Motion, *see* Kinetic Theory of Matter.
Surface Phenomena, *see* Surface Properties.

Colorimetry. Page 1213.

1. Theory.
2. Apparatus, *see* Supplementary Index.
3. Unclassified.

Cross-Reference :
See also Vision.

Comets and Meteors. Page 1213.

1. Comets.
2. Meteors.

Conduction (Electric) and Discharge in Gases. Page 1214.

1. Theory.
2. Conduction at Higher Pressures (Order of one Atmosphere). Spark and Arc. Mobility of Ions. Recombination of Ions.
3. Low-Pressure Discharge. Dark Space. Kathode Fall of Potential. Negative Glow. Positive Column. Electrodeless Discharge.
4. Ionisation by Electron Impact. Critical Potentials.
5. Ionisation by Collision with Atoms and Ions.
6. Ionisation by Chemical Action.
7. Positive Rays (Canal Rays). Anode Rays.
8. Chemical Effects of Discharge.
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References :
Auto-Electronic Emission, *see* Thermionics.
Diffraction, Scattering, Reflection, etc., of Electrons; Electron Optics; Kathode-Ray Oscillographs; Secondary Emission; *see* Electrons, etc.
Luminous Effects, *see* Spectroscopy.

Conduction (Electric) in Solids and Liquids. Page 1219.

1. Theories.
2. Voltage Measurement.
3. Current Measurement.
4. Resistance Measurement.
5. Current and Voltage Stabilisation and Amplification.
6. A.C. Resistance. Skin Effect.
7. Effects of Temperature, Pressure and Mechanical Stress on Resistivity.
8. Surface Conduction. Contact Resistance (including Contact Rectifiers).
9. Special Effects (Supraconductivity, etc.).
10. Conductivity.
    - (*a*) Metals, Alloys and Non-Metals.
    - (*b*) Liquids (including Solutions).
    - (*c*) Dielectrics.
11. Apparatus, *see* Supplementary Index.
12. Unclassified.

Cross-References :
Effect of Magnetic Field on Resistance, *see* Galvanomagnetic and Thermomagnetic Effects.
Heating Effect of Current, *see* Thermoelectricity.
Photoconductivity, *see* Photoelectricity.
Rectifiers (other than Contact) and Rectification, *see* Oscillations, Electric.
Units of Measurement, *see* Mathematical Methods, etc.

Conduction (Thermal). Page 1224.

1. Theory.
2. Conductivity Coefficients :
    - (*a*) Gases.
    - (*b*) Liquids.
    - (*c*) Solids.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Convection. Page 1225.

1. Free Convection.
2. Forced Convection.
3. Emissivity and Rate of Cooling (including Loss of Heat by Radiation, Conduction and Convection).
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cosmogony. Page 1226.

Cosmic Radiation, *see* Emission (Radiation).

Crystal Structure and Special Properties. Page 1227.

1. General Theory.
2. Crystal Structure :
    - (*a*) Metals and Alloys.
    - (*b*) Inorganic.
    - (*c*) Organic.
    - (*d*) Biological.
3. Liquid Crystals and Liquid Structure.
4. Morphology of Crystals (Crystal Form, Habit, Growth).
5. Special Properties.
6. Apparatus, *see* Supplementary Index.
7. Unclassified.

Cross-References :
Colloid Structure, *see* Colloids.
Surface Structure, *see* Surface Properties.

Density. Page 1234.

1. Density of Gases and Vapours.
2. Density of Liquids.
3. Density of Solids.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Dielectrics and Capacitance. Page 1235.

1. Theory.
2. Dielectric Constants and Electric (Dipole) Moments :
    - (*a*) Gases.
    - (*b*) Liquids and Colloids.
    - (*c*) Solids.
3. Effects of Electric and Magnetic Fields.
4. Effect of Frequency.
5. Effects of Mechanical Stress, Temperature and Moisture.
6. Dielectric Loss.
7. Capacitance and its Measurement.
8. H.F. Measurements (*see also* Alternating Current Networks).
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References :
Conduction, Electrical, in Dielectrics, *see* Conduction (Electric) in Solids and Liquids.
Electric Breakdown, *see also* Section B.—Electrical Engineering.

Diffusion and Osmosis. Page 1239.

1. Diffusion (General).
2. Osmosis.
3. Membrane Equilibria.
4. Porosity.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-Reference :
Electroosmosis, *see* Colloids.

Dilatation. Page 1240.

1. Expansion Coefficients:
    - (*a*) Gases.
    - (*b*) Liquids.
    - (*c*) Solids.
2. Apparatus, *see* Supplementary Index.
3. Unclassified.

Dynamical Problems (Astronomical). Page 1240.

Elasticity and Plasticity. Page 1241.

1. Theory.
2. Elastic Coefficients.
3. Plasticity.
4. Photoelasticity.
5. Vibrations and Waves.
6. Strength and Failure Tests.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References :
Acoustic Vibrations, *see* Acoustics.
Elastic Properties of Colloids, *see* Colloids.
Piezoelectric Oscillations, *see* Piezoelectricity.
P.V.T. Relations, *see* Thermodynamics.
Seismic Effects, *see* Seismology.

Electrochemistry. Page 1244.

1. Primary and Secondary Cells.
2. Concentration Cells.
3. Electrolysis.
4. Ionic Mobilities and Transport Numbers.
5. Electrode Potentials and Electrode Phenomena.
6. Apparatus, *see* Supplementary Index.
7. Unclassified.

Cross-References :
- Becquerel Effect, *see* Photoelectricity.

Cross-References (contd.) :
- Conductivity of Electrolytes, *see* Conduction (Electric) in Solids and Liquids.
- Electrocapillary Phenomena, *see* Surface Properties.
- Electrokinetic Phenomena, *see* Colloids.
- Photovoltaic Cells, *see* Photoelectricity.
- Theories of Solution, *see* Solution.
- Thermodynamics of Cells, *see* Thermodynamics.

Electro-Optical and Magneto-Optical Effects. Page 1248.

1. Double Refraction in Electric or Magnetic Fields.
2. Magnetic Rotation of Plane of Polarisation.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References :
- Photophoresis, *see* Emission (Radiation).
- Stark Effect, *see* Spectroscopy.
- Zeeman Effect, *see* Spectroscopy.

Electrons, Neutrons, Positrons and Protons. Page 1249.

1. Constitution.
2. Magnitudes (Charge, Mass, Magnetic Moments, etc.).
3. Collision : Diffraction, Scattering, Reflection, Absorption, Polarisation, Secondary Emission.
4. Diffusion.
5. Electron Optics.
6. Kathode-Ray Oscillographs, Applications of.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References :
- Conduction of Electricity in Metals, *see* Conduction (Electric) in Solids and Liquids.
- Structure Determination by Electron Diffraction, *see* Atomic and Molecular Structure; Crystal Structure, etc.; *and* Surface Properties.
- *See also* Atomic and Molecular Structure, *also* Radioactivity.

Electrostatics. Page 1254.

1. Theory.
2. Frictional Electricity.
3. Contact Potential.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
- Capacitance, *see* Dielectrics and Capacitance.
- Dielectric Constants, *see* Dielectrics and Capacitance.
- Units, *see* Mathematical Methods, etc.

Emission (Radiation). Page 1255.

1. General Theory (*see also* Mechanics, Quantum).
2. Black-Body Radiation. Total Intensity and Spectral Distribution (Theoretical and Experimental).
3. Selective Radiation.
4. Cosmic Rays.
5. Mechanical Effects (Photophoresis, etc.).
6. Apparatus, *see* Supplementary Index.
7. Unclassified.

Cross-References :
- Electric Waves, *see* Oscillations and Waves, Electric.

Cross-References (contd.) :
- Emissivity and Rate of Cooling by Combined Convection, Conduction and Radiation, *see* Convection of Heat.
- γ-Rays, *see* Radioactivity.
- Solar Radiation, *see* Meteorology.
- Therapeutic Effects, *see* Medical Radiology and Electrology.
- Velocity of Propagation, *see* Transmission (Radiation).
- X-Rays, *see under.*

Fluorescence and Phosphorescence. Luminescence and Afterglow. Page 1259.

1. Fluorescence.
2. Phosphorescence.
3. Luminescence and Afterglow.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
- Fluorescence and Phosphorescence Spectra, *see* Spectroscopy.

Fusion and Solidification. Page 1261.

1. Melting Points.
2. Liquefaction and Solidification.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References :
Latent Heat, *see* Calorimetry.
Standard Fixed Points, *see* Temperature.
Thermodynamic Theory, *see* Thermodynamics.

Galvanomagnetic and Thermomagnetic Effects. Page 1262.

1. Galvanomagnetic Effects :
   (*a*) Hall and Corbino Effects.
   (*b*) Ettingshausen Effect.
   (*c*) Change of Resistance in Magnetic Field.
2. Thermomagnetic Effects :
   (*a*) Nernst Effect.
   (*b*) Leduc Effect.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Geodesy. Page 1263.

1. Theory.
2. Measurements.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References :
Isostasy, *see* Gravitation.
See also Latitude and Longitude.

Geophysics, Applied. Page 1263.

1. Surveying and Prospecting :
   (*a*) Electrical Methods.
   (*b*) Gravitational Methods.
   (*c*) Magnetic Methods.
1. Surveying and Prospecting (*contd.*):
   (*d*) Seismic Methods.
2. Apparatus, *see* Supplementary Index.
3. Unclassified.

Gravitation. Page 1264.

1. General.
2. Terrestrial Gravity.
3. Value of "G."
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
Gravitational Prospecting, *see* Geophysics, Applied.
Pendulums, *see also* Mechanics, Classical.

Hydrodynamics and Aerodynamics. Page 1265.

1. Aerodynamical Theory.
2. Hydrodynamical Theory.
3. Measurement of Fluid Flow.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Hydrosphere, Physics of the. Page 1267.

1. Thermal Data.
2. Optical Data.
3. Ocean Tides and Currents.
4. Inland Lakes. Rivers.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Interference, Diffraction and Scattering (Radiation). Page 1268.

1. Interference Effects.
2. Interference, Applications.
3. Diffraction.
4. Scattering.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Compton Effect, *see* X-Rays.
Electric Waves, *see* Oscillations and Waves, Electric.
Meteorological Optics (Corona, Halo, etc.), *see* Meteorology.
Raman Effect, *see* Spectroscopy.

Kinetic Theory of Matter. Page 1270.

1. Theory :
   (*a*) Gases.
   (*b*) Liquids.
   (*c*) Solids.
2. Radiometer Effect.
3. Atomic and Molecular Rays.
4. Brownian Motion.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Photophoresis, *see* Emission (Radiation).
P.V.T. Relations, *see* Thermodynamics.

Land, Physics of the. Page 1271.

1. Earth's Interior.
2. Thermal Phenomena.
3. Physical Properties of Rocks.
4. Soil Physics.
5. Earth Tides.
6. Apparatus, *see* Supplementary Index.
7. Unclassified.

    Cross-References :
    - Isostasy, *see* Gravitation.
    - Lakes, Rivers, Seiches, *see* Hydrosphere, Physics of the.

Latitude and Longitude. Page 1273.

See also Geodesy.

Length, Area and Volume. Page 1273.

1. Standards.
2. Measurements.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

    Cross-Reference :
    - Units, *see* Mathematical Methods, etc.

Magnetism and Electromagnetism. Page 1273.

1. Theory.
2. Ferromagnetism.
3. Diamagnetism and Paramagnetism.
4. Electromagnetic Field and Electrodynamics.
5. Electromagnetic Induction. Inductance.
6. Magneto-Mechanical Effects (Gyromagnetic Effect and Magnetostriction).
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

    Cross-References :
    - Current, Voltage and Resistance Measurement, *see* Conduction (Electric) in Solids and Liquids.

    Cross-References (*contd.*)*:*
    - Earth's Magnetism, *see* Terrestrial Electricity and Magnetism.
    - Effect of Magnetic Field on Resistance, *see* Galvanomagnetic and Thermomagnetic Effects.
    - Inductive Networks, *see* Alternating-Current Networks.
    - Skin Effect, *see* Conduction (Electric) in Solids and Liquids.
    - Units, *see* Mathematical Methods, etc.

Mass. Page 1278.

1. Standards.
2. Measurements.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

    Cross-Reference :
    - Units, *see* Mathematical Methods, etc.

Mathematical Methods and Theory of Measurements. Page 1278.

1. Mathematical Methods.
2. Theory of Measurements, Probability and Errors.
3. Units and Dimensions.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Mechanics, Classical. Page 1281.

1. Statics.
2. Dynamics.
3. Statistical Mechanics (Classical).
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

    Cross-References :
    - Acceleration due to Gravity, *see* Gravitation.

    Cross-References (*contd.*) *:*
    - Astronomical Dynamics, *see* Dynamical Problems (Astronomical).
    - Elastic Vibrations, *see* Elasticity and Plasticity, *and* Acoustics.
    - Hydrodynamics and Aerodynamics, *see under.*
    - Kinetic Theory, *see* Kinetic Theory of Matter.

Mechanics, Quantum. Page 1282.

1. Matrix (or Symbolic) and Wave Mechanics.
2. Statistical Mechanics (Quantum).
3. Experimental Determination of "*h*."
4. Unclassified.

Cross-Reference :
Special Applications, *see* appropriate Key Headings.

Medical Radiology and Electrology. Page 1285.

1. Electrobiology.
2. Electrotherapy.
3. Radiography.
4. Radiotherapy :
   (*a*) Infra-Red Rays.
   (*b*) Ultra-Violet Rays.
   (*c*) X-Rays.
   (*d*) Radioactive Radiations.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Industrial Radiography, *see* X-Rays.
See also Section B.—Electrical Engineering.

Meteorology. Page 1288.

1. Constitution of the Atmosphere at Various Levels. The Ozone Layer.
2. Temperature and Radiation.
3. Dynamical Meteorology (Pressure, Wind, Turbulence, Weather Maps and Forecasting).
4. Rain, Snow, Hail, Dew, Cloud, Fog, Moisture, Dust.
5. Climatology.
6. Optical Phenomena (Aurora, Night Sky, Visibility, Corona, Halo, etc.).
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References :
Cosmic Rays, *see* Emission (Radiation).
Electrical and Magnetic Phenomena, *see* Terrestrial Electricity and Magnetism.
Visibility, *see also* Vision.

Nebulæ. Page 1293.

Oscillations and Waves, Electric. Page 1294.

1. Generation.
2. Amplification.
3. Rectification.
4. Measurement of Frequency.
5. Applications.
6. Wave Propagation :
   (*a*) General.
   (*b*) In Ionosphere.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References :
Crystal Rectification, *see* Conduction (Electric) in Solids and Liquids.
Frequency, *see also* Alternating-Current Networks.
Piezoelectric Oscillations, *see* Piezoelectricity.
See also Section B.—Electrical Engineering.

Philosophy of Scientific Method. Page 1297.

Photochemistry (including Photography). Page 1298.

1. General.
2. Photography :
   (*a*) Theory.
   (*b*) Development, Fixation, Reduction, Intensification, Toning.
   (*c*) Sensitivity and Properties of Emulsions.
   (*d*) Latent Image and Photographic Effects.
   (*e*) Kinematography and Colour Photography.

2. Photography (*contd.*) :
   (*f*) Applications. Industrial Reproduction.
   (*g*) Apparatus, *see* Supplementary Index.
   (*h*) Unclassified.

Cross-References :
Photographic Photometry, *see* Photometry.
Stellar Photography, *see* Stars.
X-Ray Photography, *see* X-Rays.

Photoelectricity. Page 1301.

1. General Theory.
2. Photoelectric Emission (Special Substances).
3. Photoelectric Cells, Properties of.
4. Photoconductivity.
5. Becquerel Effect.
6. Applications.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-Reference :
Photoelectric Photometry, *see* Photometry.

Photometry. Page 1302.

1. Theory.
2. Visual Methods.
3. Physical Methods.
4. Standards, Units.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Colour Measurement, *see* Colorimetry.
Reflecting Power, *see* Reflection, Refraction and Dispersion.
Spectrophotometry, *see* Spectra.
Stellar Photmetry, *see* Stars.
X-Ray Photometry, *see* X-Rays.

Piezoelectricity. Page 1303.

1. Statical Phenomena.
2. Piezoelectric Oscillations.
3. Pyroelectricity.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-Reference :
Piezoelectric Oscillations, *see also* Acoustics.

Planets. Page 1304.

1. General.
2. Major Planets.
3. Asteroids (Minor Planets).
4. Satellites (Moon, etc.).
5. Unclassified.

Polarisation (Radiation). Page 1305.

1. Polarisation by Reflection.
2. Polarisation by Refraction.
3. Polarisation of Scattered Radiation.
4. Rotation of Plane of Polarisation. Rotatory Dispersion. Dichroism.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Effect of Electric and Magnetic Fields, *see* Electro-Optical and Magneto-Optical Effects.
Photoelastic Measurements, *see* Elasticity and Plasticity.
Polarisation of Electric Waves, *see* Oscillations and Waves, Electric.

Pressure. Page 1307.

1. Measurements.
2. Apparatus, *see* Supplementary Index.
3. Unclassified.

Cross-References :
Effects of Pressure, *see also* appropriate Key Headings.
P.V.T. Relations, *see* Thermodynamics.

Radioactivity. Page 1308.

1. Theory.
2. Radioactive Substances and Transformations.
3. Induced Radioactivity and Artificial Disintegration.
4. α-Rays.
5. β-Rays.
6. γ-Rays.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References:
Isotopes, *see also* Atomic and Molecular Structure.
Neutrons and Positrons, *see also* Electrons, etc.

Reflection, Refraction and Dispersion (Radiation). Page 1314.

1. Reflection. Reflecting Power.
2. Geometrical Optics. Optical Imagery.
3. Aberration (Spherical and Chromatic), Tests for Definition, Distortion, Astigmatism, etc.
4. Refraction and Dispersion.
5. Glasses, Optical Media and Materials.
6. Apparatus, *see* Supplementary Index.
    - (*a*) Mirrors, Microscopes and Telescopes.
    - (*b*) Refractometers.
    - (*c*) Goniometers.
    - (*d*) Projectors (Lighthouses, Lanterns, etc.).
    - (*e*) Lenses, Objectives, Prisms, Eyepieces.
7. Unclassified.

Cross-References :
Double Refraction in Magnetic and Electric Fields, *see* Electro-Optical and Magneto-Optical Effects.
Electric Waves, *see* Oscillations and Waves, Electric.
γ-Rays, *see* Radioactivity.
Meteorological Optics, *see* Meteorology.
Photoelastic Measurements, *see* Elasticity and Plasticity.
X-Ray Reflection, etc., *see* X-Rays.

Relativity and Ether. Page 1317.

1. Special (or Restricted) Theory of Relativity.
2. General Theory of Relativity.
3. Unitary Field Theory.
4. Unclassified.

Cross-References :
Cosmology, *see* Cosmogony.
Doppler Effect, *see* Transmission (Radiation).
Velocity of Light, *see* Transmission (Radiation).

Seismology. Page 1318.

1. Theory.
2. Observational.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References :
Earth Tides, *see* Land, Physics of the.

Solution. Page 1320.

1. Theory.
2. Solubility.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References :
General Properties of Solutions, *see* Appropriate Key-Headings.

Cross-References (contd.) :
Heats of Solution, *see* Thermochemistry.
Surface Phenomena, *see* Surface Properties.
Thermodynamical Effects, *see* Thermodynamics.

Spectroscopy. Page 1321.

1. Spectrum Analysis.
2. Atomic (Line) Spectra :
    - (*a*) Wave-Length Standards.
    - (*b*) Observation of Line Spectra in Emission.
    - (*c*) Observation of Line Spectra in Absorption.
    - (*d*) Analysis of Line Spectra.
    - (*e*) Photometric Intensities and Contours of Lines.
    - (*f*) Hyperfine Structure and Nuclear Moments.
    - (*g*) Theoretical.
3. Molecular (Band) Spectra :
    - (*a*) Observation and Analysis of Rotation (far infra-red) and Vibration (infra-red) Bands in Emission and Absorption.
    - (*b*) Observation and Analysis of Electronic Bands and Band-Systems (near infra-red, visible and ultraviolet) in Emission and in Absorption.
    - (*c*) Photometric Intensities of Bands and of Band-Lines and their Application to Nuclear Moments and Effective Temperatures.
    - (*d*) Theoretical.
4. Continua :
    - (*a*) In Emission.
    - (*b*) In Absorption.
5. Line and Band Spectra in Fluorescence and Phosphorescence.
6. Zeeman Effect.
7. Stark Effect.
8. Raman Spectra.
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References :
Absorption, *see also* Absorption (Radiation).
Critical Potentials, *see also* Conduction (Electric) and Discharge in Gases.
Fluorescence and Phosphorescence, *see also* Fluorescence, etc.
Solar Spectrum, *see* Sun.
Stellar Spectra, *see* Stars.
X-Ray Spectra, *see* X-Rays.

Stars. Page 1334.

1. Parallax, Magnitudes, Diameter, Mass, Density.
2. Motions.
3. Spectra.
4. Temperature.
5. Constitution and Evolution.
6. Galactic System.
7. Star Clusters and Clouds.
8. Variable Stars, Binaries and Novæ.
9. Catalogues and Stellar Photography.
10. Unclassified.

Sun. Page 1340.

1. Chromosphere and Prominences.
2. Corona. Eclipse.
3. Sunspots and Faculæ.
4. Temperature.
5. Parallax, Size, Motion.
6. Spectrum.
7. Magnetism.
8. Unclassified.

Cross-Reference :
Solar Radiation, *see* Meteorology.

Surface Properties. Page 1342.

1. Adsorption :
   (*a*) Gases.
   (*b*) Liquids.
2. Surface Tension.
3. Surface Structure.
4. Parachors.
5. Films (*see also* Surface Structure).
6. Cohesion and Adhesion.
7. Lubrication.
8. Electrical Phenomena at Interfaces.
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References :
Electrokinetic Phenomena, *see* Colloids.
Lubrication, *see also* Section B.—Electrical Engineering.

Temperature. Page 1348.

1. Scales and Standard Temperatures.
2. Temperature Measurement and Control.
3. Low Temperature Research.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
Flame, Ignition, Explosion Temperatures, *see* Thermochemistry.
Cross-References (*contd.*) *:*
Liquefaction of Gases, *see* Vaporisation and Condensation.
Temperature of Earth, Air, Sea, *see* Land, Physics of the; Meteorology; Hydrosphere, Physics of the.

Terrestrial Electricity and Magnetism. Page 1350.

1. Atmospheric Electricity. Ionosphere.
2. Earth's Magnetic Field.
3. Earth Currents.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
Aurora, *see* Meteorology.
Cross-References (*contd.*) *:*
Cosmic Rays, *see* Emission (Radiation).
Electric Wave Propagation in Ionosphere, *see* Oscillations and Waves, Electric.
Magnetism of Rocks, *see* Geophysics, Applied; *also* Land, Physics of the.

Thermionics. Page 1352.

1. Theory.
2. Measurement of Work Function and Other Emission Constants.
3. Effect of Surface Layers.
4. Effect of Intense Fields (Auto-Electronic Effect).
5. Emission of Positive Ions.
6. Apparatus, *see* Supplementary Index.
7. Unclassified.

Cross-References :
Secondary Electronic Emission, *see* Electrons, etc.
Valves, *see also* Oscillations and Waves, Electric.

Thermochemistry. Page 1354.

1. Heats of Solution and Dilution.
2. Heat of Combustion.
3. Heats of Formation and Dissociation.
4. Flames, Ignition, Explosion.
5. Effect of Temperature on Chemical Processes and Equilibria.
6. Apparatus, *see* Supplementary Index.
7. Unclassified.

Cross-References :
Heat of Adsorption, *see* Surface Properties.
Thermodynamics of Chemical Processes, *see* Thermondynamics.

Thermodynamics. Page 1356.

1. Fundamental Principles (1st and 2nd Laws). Mechanical Equivalent of Heat.
2. Equations of State and Critical Phenomena. (Theoretical and Experimental).
3. Applications to Specific Heats and Latent Heats.
4. Phase Rule and Applications.
5. Measurements of and Formulæ for Entropy, Internal Energy, Total Heat (Enthalpy), Free Energy (Thermodynamic Potential at Constant Volume and Temperature), Gibbs' Function (Phase Potential, Thermodynamic Potential at Constant Pressure and Temperature), etc.
6. Thermodynamics of Chemical Processes.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References :
Absolute Scale of Temperature, *see* Temperature.
Kinetic Theory, *see* Kinetic Theory of Matter.

Thermoelectricity. Page 1361.

1. Theory.
2. Thermoelectric Power, Peltier Coefficient, Thomson Coefficient.
3. Heating Effect of Current.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-Reference :
Thermoelectric Measurement of Temperature, *see* Temperature.

Time. Page 1361.

1. Solar and Stellar Time.
2. Secondary Standards.
3. Measurements.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
Pendulums, *see also* Mechanics, Classical.
Units, *see* Mathematical Methods, etc.

Transmission (Radiation). Page 1362.

1. Velocity of Propagation.
2. Diathermancy and Transparency.
3. Doppler Effect.
4. Signalling.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Absorption, *see* Absorption (Radiation).
Electric Waves, *see* Oscillation and Waves, Electric.
Visibility, *see* Meteorology *and* Vision.

Vaporisation and Condensation. Page 1363.

1. Boiling Points.
2. Evaporation (Distillation).
3. Condensation (Liquefaction).
4. Vapour Pressure.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Hygrometers, *see* Meteorology.
Latent Heat, *see* Calorimetry.
Theory, *see* Thermodynamics.

Viscosity and Friction. Page 1365.

1. Theory.
2. Measurement of Viscosity.
3. Relations between Viscosity and Other Properties.
4. Friction of Solids (Internal and External).
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Lubrication, *see* Surface Properties *and* Section B.—Electrical Engineering.
Viscosity of Colloids, see Colloids.

Vision. Page 1366.

1. Theories of Vision.
2. Phenomena of Vision.
3. Optics of the Eye.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
Measurement of Colour, *see* Colorimetry.
Visibility, *see also* Meteorology.

X-Rays. Page 1368.

1. Phenomena of the X-Ray Tube.
2. Reflection, Refraction, Diffraction and Scattering.
3. Absorption and Ionisation.
4. Emission Spectra.
5. Absorption Spectra.
6. Measurements of Intensity, Quality, Wave-Length, etc.
7. Chemical and Photographic Action.
8. Applications (Industrial Radiography, and Chemical Analysis).
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References :
Constitution of Atoms and Molecules, *see* Atomic and Molecular Structure.
Photoelectric Emission by X-Rays, *see* Photoelectricity.
Polarisation of X-Rays, *see* Polarisation (Radiation).
Radiography (Medical) and Radiotherapy, *see* Medical Radiology and Electrology, *and* Section B.—Electrical Engineering.
Structure of Crystals, *see* Crystal Structure and Special Properties.

Zodiacal Light and Gegenschein. Page 1370.

SUBJECT INDEX.

Absorption (Radiation).

1. Visible Region.
2. Infra-Red Region.
3. Ultra-Violet Region.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
Absorption Spectra, *see* Spectroscopy.
Cosmic Rays, *see* Emission (Radiation).
Diathermancy, *see* Transmission (Radiation).

Cross-References (contd.) :
Dichroism, *see* Polarisation (Radiation).
Electric Waves, *see* Oscillations and Waves, Electric.
γ-Rays, *see* Radioactivity.
Meteorological Optics, *see* Meteorology.
Visibility, *see* Meteorology, *also* Vision.
X-Ray Absorption, *see* X-Rays.

1. Visible Region.

Abstract Nos.

Comparative Study of Some Violet Absorbing Filters. P. L. Bayley 619
Calculation of Absorption Coefficients of Daylight in Natural Waters. R. T. Young, Jr. 1929
Influence of Temperature on the Excitation of Colour Centres. H. Pick 1967
Reflection and Absorption of Visible Radiation in the System KCl-CuCl$_2$. G. Glockler and R. E. Dietmeier 2442
Analysis Filters in Colour Reproduction. H. D. Murray and D. A. Spencer 3225
Absorption of Light by Crystals. N. F. Mott 4069
Optical Properties of Liquid Suspensions. L. Amy 4462
Theory of Absorption in Ionised Gas. Part I. Opacity in Stellar Material. Part II. Optical Properties of Liquid Metals. B. Majumdar 4463
Colour in Relation to Chemical Constitution. I. N. D. Dass and S. Dutt 4464
Gas Absorption and Optical Constants of Thin Metal Foils. M. Kindinger and K. Koller 4503
Colour and Chemical Constitution of Salts of Diphenyl Violuric Acid. S. Prakash and S. Dutt 4903
Optical Properties and Photoelectric Emission in Thin Alkali Metal Films. H. E. Ives and H. B. Briggs 5078

2. Infra-Red Region.

Transmission of Oxides in the Far Infra-Red. M. Parodi 233
Transmission of Zinc Blende and of the Copper and Cadmium Halides in the Far Infra-Red. M. Parodi 738
Electrical and Optical Properties of Oxides of Cd, Tl and Sn. G. Bauer 836
Change in Absorption of Water at $4 \cdot 7\mu$ Due to Solutions. E. K. Plyler and E. S. Barr 2840

3. Ultra-Violet Region.

Applicability of Christiansen Filters. K. v. Fragstein 1968
U.V. Absorption of Gold and Silver. D. Coster, S. Hof, G. Rathenau and C. F. E. Simons 3207
Absorption Coefficients of Ozone in the Region of the Chappuis Bands. A. Vassy 3656

5. Unclassified.

Optical Constants of Rubidium and Caesium. H. E. Ives and H. B. Briggs 191

Acoustics.

1. Theory of Waves and Vibrations.
2. Plates, Rods and Membranes.
3. Vibrating Columns of Air or other Gases.
4. Strings.
5. Velocity, Measurement of.
6. Propagation in the Atmosphere.
7. Supersonic Vibrations.
8. Architectural Acoustics.
9. Receivers and Reproducers.
10. Speech and Hearing. Noise.
11. Measurements of Absorption, Amplitude, Intensity, Frequency, Wave-Form, Radiation Pressure.
12. Apparatus, *see* Supplementary Index.
13. Unclassified.

Cross References :
Architectural Acoustics, Noise, Receivers and Reproducers, *see also* Section B.—Electrical Engineering.

For the **Key** to this Index see pp. 1182 to 1194.

Acoustics, *continued.*

1. Theory of Waves and Vibrations.

Abstract Nos.
Propagation of Sound in Gases. H. L. Saxton 796
Stresses Produced in Solids by Sound Waves. A. D. Fokker 1254
Transmission of Compression Waves through a Solid Plate Immersed in a Fluid. H. Reissner 1814
Reflection of Plane Wave Pulses from Plane Parallel Plates. M. Muskat 2013
Formulæ for Calculation of the Velocity of Sound and of the Melting Point. R. Gianasso 2095
States of Vibration of a Hollow Quartz Cylinder. Ny Tsi-Zé and Chung Ming-San 2096
Distortion of a Sound Field by a Rigid Sphere. H. Stenzel 2525
Diffraction by Cylindrical and Cubical Obstacles and by Circular and Square Plates. G. G. Muller, R. Black and T. E. Davis 3325
Operational Treatment of Nonlinear Dynamical Systems. L. A. Pipes 3326
Finite Solid Acoustic Filters. R. B. Lindsay and A. B. Focke 3327
Operational Solution of the Wave Equation. L. A. Pipes 3947
Wave-Motion for Infinite Domains. A. N. Lowan 3948
Free Volumes and Free Angle Ratios of Molecules in Liquids. J. F. Kincaid and H. Eyring 4330
Dunkerley's Frequency Formula. E. Jouguet 4602
Filtration of Sound. R. B. Lindsay 5005

2. Plates, Rods and Membranes.

Vibration of Free Circular Plates. Part I. Normal Modes. Part II. Compounded Normal Modes. Part III. Chladni's Original Figures. M. D. Waller 273
Theoretical and Experimental Determinations of the Flexural Oscillations of a Freely Oscillating Elliptic Plate. B. Pavlik 274
Radial and Torsional Vibrations of Annular Quartz Plates. A. Žáček and V. Petržílka 797
Theory of Indian Musical Drums. Part I. K. N. Rao 2097
Periods of Longitudinal Vibration of Steel Cones and Truncated Cones. G. W. Pierce and A. Noyes, Jr. 2526
Bells. J. Arts 2527
Undertones. E. Waetzmann and R. Kurtz 2528
Equilibrium of Membranes. H. Pailloux 2692
Vibrations of Symmetrical Plates and Membranes. R. C. Colwell, A. W. Friend and J. K. Stewart 3328

3. Vibrating Columns of Air or Other Gases.

Modulation of Electric Current by Variable Flames. Z. Carrière 275
Timbre Phenomena in the Church Organ. F. Trendelenburg 1255
Organ Pipes and Edge Tones. G. B. Brown 1256
Theory of the Clarinet. R. N. Ghosh 1257
Position of Vibrator in Experiments of Melde and Kundt. B. J. Miller and L. O. Olsen 2098
Tones Produced by a Wire in a Gas Flame. J. J. Coop 2529
Tone-Quality of Organ Pipes. M. Mokhtar 2954
Acoustical Conductivity of Orifices. N. W. Robinson 2955
Acoustic Spectra of Organ Pipes. C. P. Boner 3329
Equivalent Lengths and Length Corrections in Acoustic Systems. F. H. van den Dungen 4603
Maintenance and Stabilisation of Singing Flames. Z. Carrière 4604
"Transverse" Acoustic Waves in Rigid Tubes. H. E. Hartig and C. E. Swanson 5006

4. Strings.

Mechanical Action of Violins. F. A. Saunders 276
Violin. P. Jarnak 1692
Normal Modes of Non-Homogeneous Strings. A. Erdélyi 3330
Motion of Loaded Vibrating String. D. N. Sen and R. Kumar 4605
Musical Quality of a Violin. H. Meinel 5007

Acoustics, *continued.*

5. Velocity, Measurement of.

Abstract Nos.
Measurement of the Speed of Sound in Liquids by Resonance. C. Sălceanu 798
Resonance of Liquids in Tubes. C. Sălceanu and C. Istraty 1693
Acoustic Resonance Spectra of Liquids. C. Sălceanu and C. Istraty 1694
Velocity of Sound in Air. T. J. Kukkamäki 2099
Velocity of Sound in Single Crystals of Bismuth. A. B. Focke, R. B. Lindsay and C. R. Wilks 2100
Dispersion of Acoustic Velocity in Liquids. B. V. R. Rao 2530
Velocity of Sound in Liquid Nitrogen. E. Hirschlaff 2531
Velocity of Sound in Air. R. C. Colwell, A. W. Friend and D. A. McGraw 2956
Velocity of Sound in Oxygen Gas at Liquid Oxygen Temperatures. A. van Itterbeek and O. van Paemel 3331
Velocity and Absorption of Sound in Nitric Oxide in a Magnetic Field. A. van Itterbeek and L. Thys 3332
Properties of Gaseous He at Liquid He Temperatures. A. van Itterbeek 4585
Velocity of Sound in Liquid Helium. J. C. Findlay, A. Pitt, H. G. Smith and J. O. Wilhelm 4606
Velocity of Sound in Copper. G. E. Allan 4607
New Method of Measuring Wave Speeds. S. J. Plimpton 5008
Velocity of Sound in A and D_2 at Liquid O_2 and H_2 Temperatures. Second Virial Coefficient of Argon. A. van Itterbeek and O. van Paemel 5009
Absorption and Velocity of Sound in H_2, D_2, He and Ne. A. van Itterbeek and L. Thys 5010

6. Propagation in the Atmosphere.

Transmission of Sound Over Reflecting Surfaces. G. W. Pierce and A. Noyes, Jr. 799

7. Supersonic Vibrations.

Effect of Ultrasonic Waves on Solubility of Colloids. Part III. N. Sata 27
Luminescence in Liquids under Ultrasonic Treatment. V. L. Levšin and S. N. Rževkin 167
Periodicities in Images of Ultrasonic Waves. E. Hiedemann and E. Schreuer 277
Interference Phenomenon with Supersonic Waves. E. Schreuer and K. Osterhammel 278
Wave Field of a Piezo-Quartz Radiator. S. N. Rževkin 279
Ultrasonic Velocity in Gases Between 1 and 100 Atmospheres. A. H. Hodge 280
Ratio of Specific Heats of Air, N_2, and CO_2 as a Function of Pressure by the Ultrasonic Method. J. C. Hubbard and A. H. Hodge 281
Effect of Ultrasonic Waves on Colloidal Phenomena. Part IV. N. Sata and Y. Niwase 415
Acoustical Detection of Electrically Weak Vibrations in Quartz Plates. W. H. Pielemeier 800
Supersonic Waves in Gases. D. Riabouchinsky 801
Apparatus for Acoustic Research in the Supersonic Frequency Range. A. Noyes, Jr. and G. W. Pierce 1258
Supersonic Absorption in Smokes. T. J. Laidler and E. G. Richardson 1259
Effect of Containing Tubes on Ultrasonic Velocities in Benzene. W. H. Hulswit, Jr. 1260
Supersonics in Relation to Molecular Constitution. E. G. Richardson 1261
Hydrosol of the Magnetic Oxide of Iron. T. Katsurai 1382
Charged Colloid Particles in an Ultrasonic Field. J. J. Hermans 1388
Dispersion of Supersonic Waves in Liquids. Parts I and II. G. B. Špakovskij 1695
Sound Velocity and Chemical Constitution. S. Parthasarathy 1696
Velocity of Sound by Capillary Supersonic Interference. J. P. Cance 1697
Supersonic Measurement of Elastic Constants of Solids. A. Walti 1813
Dispersion of Supersonic Waves in Liquids. A. K. Dutta 2101
Birefringence of Liquids Produced by Supersonic Waves. R. Lucas 2102
Absorption of Supersonic Vibrations in Solid and Liquid Media. N. F. Otpushtshennikov 2103

Acoustics, *continued.*

Abstract Nos.

Influence of Supersonic Waves on the Viscosity of Colloidal Solutions. H. Freundlich and D. W. Gillings 2220
Effect of Supersonic Waves on Solutions of Highly Polymerised Substances. E. Thieme 2221
Wave Phenomena in Models Using Supersonic Waves. S. Kretschmer and S. Rshevkin 2532
Supersonic Waves in Liquids under Pressure. P. Biquard 2533
Diffraction of Light by Supersonic Waves in Solids. N. S. N. Nath 2534
Absorption of Supersonics in Liquids by an Optical Method. H. Grobe 2535
Diffraction of Light by Supersonic Waves in Solids. E. Hiedemann 2536
Compressibility and Solvation of Solutions of Electrolytes. A. Passynski 2730
Recent Progress in Supersonics. W. T. Richards 2957
Transparency of Solid Plates to Supersonic Waves. E. Baumgardt 2958
Propagation of Supersonics in Capillary Tubes. J. May 2959
Determination of Elasto-Optical Constants with Supersonic Waves. H. Mueller 2960
Grating Theory. J. F. C. Patry 2961
Precision Method of High Absolute Accuracy for Determining the Velocity of Supersonic Waves in Liquids. N. Seifen 2962
Supersonics. E. Baumgardt 3333
Simultaneous Raman Diffraction with Several Supersonic Waves. L. Bergmann and E. Fues 3334
Dynamical Theory of the Space-Lattice Diffraction. Parts I and II. E. Fues 3335
Molecular Rearrangement Induced by Supersonic Waves. C. W. Porter and L. Young 3336
Ultrasonic Centrifuge. P. Girard and N. Marinesco 3455
Ultrasonic Radiation Field of a Quartz Disc Radiating into Liquid Media. F. E. Fox and G. D. Rock 3792
Absorption of Supersonic Waves in Electrolytes. P. Bažulin 3793
Elastic Constants of Transparent Isotropic Solids. K. H. Hoesch 3922
Fluorometer. O. Maercks 4094
Effect of Ultrasonic Vibrations on the Discharge Potential of Hydrogen. R. Piontelli 4179
Supersonic Measurement of Adiabatic Elasticity of Crystals. E. Baumgardt 4180
Dispersion of Solids in Liquids by Supersonic Waves. K. Söllner 4181
Supersonic Waves as Optical Shutter. O. Maercks 4182
Supersonic Interference Method of Measuring the Velocity of Sound. J. P. Cance 4183
Sound Velocity in D$_2$O and its Compressibility. K. Yosioka 4184
Velocity of Supersonic Waves in Liquid Oxygen. H. W. Liepmann 4185
Transmission of Supersonic Waves Through Thin Sheets. R. Bär 4186
Transmission of Supersonic Waves Through a Rigid Sheet. F. Levi and N. S. N. Nath 4187
Supersonics. E. Baumgardt 4608
Total Reflection of Supersonic Waves. S. I. Kretschmer and S. N. Rschevkin 4609
Diffraction of Light by Superposed Supersonic Waves. M. A. G. Rau 4610
Diffraction of Light by Supersonic Waves. K. N. Rao 4611
Circuit Details for a Small Supersonic Oscillator of the Piezoelectric Type. W. C. Bosch and W. G. Allée, Jr. 4612
Charged Colloid Particles in an Ultrasonic Field. Part II. J. J. Hermans 4751
Absorption Measurements of Supersonic Waves in Aqueous Solutions. W. Buss 5011
Supersonic Dispersion in Liquids. R. Bär 5012
Excitation of Intramolecular Vibrations in Gases and Gas Mixtures by Collisions. Part V. L. Küchler 5013

8. Architectural Acoustics.

Whispering Gallery of St. Paul's Cathedral, London. A. E. Bate 1263
Sound Absorption and Attenuation by the Flue Method. H. O. Taylor and C. W. Sherwin 2537
Measurement of Absorption in Rooms with Sound Absorbing Ceilings. J. R. Power 4613
Absorption Effects in Sound-Transmission Measurements. P. E. Sabine and L. G. Ramer 5014

Acoustics, *continued.*

9. Receivers and Reproducers.

Abstract Nos.
Electro-Acoustical Musical Instruments. V. Aschoff ... 282
Influence of a Resonator upon a Sound Field. K. Satô and K. Kubo ... 3337
Groove-Needle Factors in Sound Reproduction from Gramophone Records. J. A. Pierce and F. V. Hunt ... 3338

10. Speech and Hearing. Noise.

Vowel Characteristics. P. R. Farnsworth ... 283
Vowel Structure. A. Gemelli ... 284
Nonlinear Transmission Characteristics of the Auditory Ossicles. O. Stuhlman, Jr. ... 285
Nature of Fatigue in the Auditory System. R. C. Parker ... 286
Electrical Responses of the Ear. E. G. Wever and C. W. Bray ... 802
Subjective and Objective Measurements of Noise. E. Lübcke ... 1262
Time of Closure of Glottis from Records of Vowel Sounds. F. Trendelenburg and W. Trendelenburg ... 1698
Limits for Audition for Bone Conduction. N. A. Watson ... 2104
Minimal Discrimination of Intensities. Part III. W. J. Crozier and A. H. Holway ... 2485
Loudness, Masking and their Relation to the Hearing Process and the Problem of Noise Measurement. H. Fletcher ... 2538
Expression of the Opening and Closing of the Glottis in the Period of the Sound in Air. W. Trendelenburg and W. Hartmann ... 2963
Mechanism of the Internal Ear. J. A. Reboul ... 3339
Influence of Acoustic Stimuli Upon the Limits of Visual Fields for Different Colours. P. A. Yakovlev ... 3751
Break in Register in Singing. W. Trendelenburg ... 3794
Masking Effect of Noise and the Mechanism of Hearing. H. Fletcher ... 4188
Hearing during Noise. Physiological Effect. Y. Rocard ... 4614
Noise Measurements aboard Ship. H. A. Simms ... 4615
Harmonic Structure of Vowels in Singing. B. Stout ... 5015
New Method of Determining the Uniaural Differential Threshold. J. W. Hughes ... 5016

11. Measurements of Absorption, Amplitude, Intensity, Frequency, Wave-Form, Radiation Pressure.

Directive Effective of Sound Field on Non-Spherical Particles. R. Pohlman 803
Electronic Voltmeter with Logarithmic Scale. M. Nuovo ... 1278
Improved Magnetostriction Oscillator. G. W. Pierce and A. Noyes, Jr. ... 1699
Absorption of Sound in Carbon Dioxide. A. van Itterbeek and P. Mariëns ... 2105
Influence of a Magnetic Field on the Absorption of Sound in Oxygen. A. van Itterbeek and L. Thys ... 2106
Absolute Sound Intensity in Liquids by Spherical Torsion Pendulums. E. Klein 2107
M.K.S. Units in Electro-Acoustics. A. E. Kennelly and J. H. Cook ... 2539
Influence of a Resonator upon the Sound Field. K. Satô ... 2964
Reflection of Sound. K. F. Herzfeld ... 2965
Sound Absorption and Dispersion in Liquids. H. O. Kneser ... 3340
Acoustical Output of Air Sound Senders. O. Devik and H. Dahl ... 3341
Standing Wave in Water Column Measured by a Broca-Tube. Y. Nisimura and Y. Kohasi ... 3795
Absorption of Sound in CO_2 and Other Gases. V. O. Knudsen and E. F. Fricke 4616
Absolute Sound Measurements in Liquids. E. Klein ... 4617
Adjustable Tuning Fork Frequency Standard. O. H. Schuck ... 4618
Absorption and Velocity of Sound in H_2, D_2, He and Ne. A. van Itterbeek and L. Thys ... 5010
Theory of Chromatic Stroboscope. R. W. Young and A. Loomis ... 5017
Acoustic Experiments on Fresnel Diffraction. H. K. Schilling ... 5018

13. Unclassified.

Sound. E. G. Richardson ... 1264
Internal Friction of Wood. F. Krüger and E. Rohloff ... 3984
Method of Gas Analysis Based upon the Optical-Acoustic Tyndall-Röntgen Effect. M. Veingerov ... 4575

For the **Key** to this Index see pp. 1182 to 1194.

Acoustics, *continued.*

Abstract Nos.

Acoustics. Part II. E. Meyer 5020
Frequency Ratios of the Tempered Scale. C. Williamson 5021

Acoustic Radiation Pressure. E. F. Ghiron 1068B
Method of Harmonic Analysis. G. F. Partridge 1181B
Absorption of Sound by Porous Walls. A. F. Monna 1778B
Absorption of System of Resonators. S. N. Rschevkin 1779B
Prevention of Transmission of Sound along Water Pipes. J. E. R. Constable 1780B
Transmission of Sound in a Building by Indirect Paths. J. E. R. Constable 1781B
Reverberation Time and Sound Intensity by Fluxmeter. R. Fleurent and M. Beauvilain 2064B
Noise Insulation. G. W. C. Kaye 2357B
Reduction of Noise from Air Compressor. J. E. R. Constable 2358B
Automatic Measurement of Atmospheric Noise in Radio Receivers. K. Maeda and H. Yokoyama 2550B
Reverberation Measurement. A. Bielusici and O. Roman 2837B
Acoustical Insulation by Double Partitions of Dissimilar Components. J. E. R. Constable 2839B
Noise Measurement. P. Huber 2841B
Reduction of Structure-Borne Noise by Vibration-Attenuating Supports. A. J. King 2967B, 2968B
Vibration of Power Lines in Steady Wind. R. Ruedy 3008B
Forced Vibration of Circular Membrane, Plate, or Hollow Sphere. M. Matudaira and T. Hayasaka 3116B
Experiments on Supersonic Radiation. A. Giacomini 3258B
Voice Frequency Spectrometer. E. Freystedt and F. Bath 3407B

Adsorption.

(*See* **Surface Properties**).

Alternating-Current Networks.

1. Circuit Theory.
2. A.C. Bridges, Applications of.
3. H.F. Measurements (*see also* Dielectrics and Capacitance).
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-Reference :
Frequency, *see also* Oscillations and Waves, Electric.

1. Circuit Theory.

Solution of Variable Circuits by Matrices. L. A. Pipes 804
Relaxation Methods Applied to Engineering Problems. Part II. Basic Theory, with Applications to Surveying and to Electrical Networks, and an Extension to Gyrostatic Systems. A. N. Black and R. V. Southwell 946
Operational Representation of Discontinuous Functions. L. A. Pipes 1265
Operational and Matrix Methods in Linear and Variable Networks. L. A. Pipes 2541
Applications of Lagrangian Equations to Electrical Circuits. D. A. Wells 2966
Kirchhoff Constraints and Sagittal Graphs. W. H. Ingram 4189
Relaxation Methods Applied to Engineering Problems. Part III. Problems Involving Two Independent Variables. D. G. Christopherson and R. V. Southwell 4776

2. A.C. Bridges, Applications of.

Dielectric Measurements on Hydrophilic Colloids. Part II. P. J. Denekamp and H. R. Kruyt 317
Dielectric Measurements on Hydrophilic Colloids. Part III. H. R. Kruyt and J. T. G. Overbeek 833
Absolute Measurement of Resistance. L. Hartshorn and N. F. Astbury 1280
Null Methods of Calibrating Sensitive A.C. Instruments. W. Hohle and W. Rump 2108
Calibration of Decade Condensers. L. H. Ford and N. F. Astbury 2109
Screened Sub-Standard Inductometer. N. F. Astbury and L. H. Ford 3027
Ratio of International Ohm to Absolute Ohm. R. Jouaust, M. Picard and R. Herou 3355

Alternating-Current Networks, *continued.*

Abstract Nos.

Determination of the Frequency of an Oscillator with a Condenser. H. Mukherjee 3871
Effects of Stray Admittances in Four-Arm Bridge Networks. N. F. Astbury 4619
Relative and True Power Factors of Air Capacitors. A. V. Astin 5022
Determination of Absolute Ohm, Using an Improved Self Inductor. H. L. Curtis, C. Moon and C. M. Sparks 5031
Differential Amplifier for Electrophysiology and for Bridge Measurements. H. König 5067

3. H.F. Measurements (*see also* Dielectrics and Capacitance).

Production and Absorption of Electromagnetic Waves from 3 cm. to 0·6 cm. in Length. N. H. Williams 366
Current and Potential Measurements with Ultra-Short Waves. J. Malsch 367
Measurement of Current at Radio Frequencies. T. I. Jones 1279
Experiments at Radio Frequencies on Supraconductors. F. B. Silsbee, F. G. Brickwedde and R. B. Scott 1284
Effect of Residual Inductances in H.F. Capacitance Measurement. J. G. Miller 1297
Capacitance at Ultra-High Frequencies. R. King 1298
H.F. Permeability of Thin Electrolytic Iron Layers. S. Procopiu and G. d'Albon 1326
Electrical Resistance of Selenium at High Field Strengths. F. P. Henninger 2130
H.F. Dielectric Loss of Liquids. P. Wulff and H. Schwindt 2577
Measurement of R.F. Voltage in a Cyclotron. W. E. Danforth and M. B. Sampson 3352
Velocity of Propagation of Electric Waves along Thin Metal Wires and the Permeability of Iron for Hertzian Oscillations. K. F. Lindman 3418
Mutual Shunt Method of Measuring Self Inductance at Radio Frequencies. A. Campbell 3796
Effect of Condenser Leads in Lecher Wire Measurements. H. Slätis 4620
Comparison of Capacities at Radio Frequencies. W. Vaughan 5043
Velocity of Propagation of Electric Waves along Nickel Wires and Magnetic Permeability of Nickel for Hertzian Oscillations. K. F. Lindman 5074

5. Unclassified.

A.C. Compensation Arrangement. W. Oesinghaus 74B
Electrical Measuring Bridge. P. G. Cath 76B
R-Matrices and Equivalent Networks. Part I. R. S. Burington 783B
Impedance and Energy Relations in Networks. H. W. Bode 1540B
Extension of Thevenin's Theorem. H. Ataka 1660B
Resonance Theory of Series Non-Linear Control Circuits. E. G. Keller 2151B
Owen Inductance Bridge. T. Walcher 2908B

Astronomical Apparatus and Observatory Equipment.

(*See* Supplementary Index).

Atomic and Molecular Structure.

1. Nuclear Constitution (*see also* Electrons, etc., *and* Radioactivity).
2. Isotopes and Isobares.
3. Periodic System.
4. Valency.
5. Molecular Structure (*see also* Spectroscopy).
6. Allotropy.
7. Association.
8. Atomic and Molecular Magnitudes.
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References :
Artificial Disintegration, *see* Radioactivity.

Cross-References (contd.) :
Atomic and Molecular Rays, *see* Kinetic Theory of Matter.
Atomic and Molecular States and Vibrations, *see* Spectroscopy.
Critical Potentials, *see* Conduction (Electric) and Discharge in Gases.
Dipole Moments and Molecular Polarisation, *see* Dielectrics and Capacitance.
Liquid Structure, *see* Crystal Structure and Special Properties.
Nuclear Moments, *see* Spectroscopy.

Atomic and Molecular Structure, *continued.*

1. Nuclear Constitution. (*See also* Electrons, etc. *and* Radioactivity).

Abstract Nos.
Geometrical Model of the Atomic Nucleus. W. Wefelmeier 1
Validity of Methods in Nuclear Calculations. D. T. Warren and H. Margenau 2
Recent Results of Experimental Nuclear Investigations. R. Fleischmann.... 388
Theoretical Investigation of Nuclear Forces. F. Hund 389
Energy Levels of a Heavy Nucleus. I. Gurevitsch 390
Exchange Phenomena and Isomeric Nuclei. T. Kahan 391
Molecular Viewpoints in Nuclear Structure. J. A. Wheeler 392
Mathematical Description of Light Nuclei by the Method of Resonating Group Structure. J. A. Wheeler 393
Variation of Light Atomic Nuclei from the Hartree Model. B. O. Grönblom.. 900
Atomic Physics. C. H. Collie 901
Theory of Nuclear Reactions. L. Goldstein 902
Nuclear Structure of Light Atoms. B. M. Sen 1367
Nuclear Photo-Effects. N. Bohr 1368
Theory of Showers of Protons and Neutrons. L. Goldstein 1369
Binding Energy of the Deuteron. H. A. Bethe 1370
Density of Nuclear Energy Levels on the Oscillator Model. K. Umeda...... 1759
Quantum Theory of Einstein-Bose Particles and Nuclear Interaction. N. Kemmer 1760
Electromagnetic Properties of Nuclear Systems. W. E. Lamb, Jr. and L. I. Schiff 1761
Exchange Character of Nuclear Forces from the β-Decay Theory. K. Nakabayasi 1961
Theory of Neutrinos. G. Wataghin 1977
Geometrical Structure of Space and Electronic Atmospheres. G. Fournier 2204
Nuclear Structure Models. C. F. v. Weizsäcker 2205
Nuclear Forces and the Magnetic Moments of the Neutron and the Proton. H. Fröhlich, W. Heitler and N. Kemmer 2206
Principle of the Conservation of Electricity. A. Boutaric 2618
Rotation of the Atomic Nucleus. E. Teller and J. A. Wheeler 2644
Saturation of Nuclear Forces. C. Critchfield and E. Teller 2645
Energy Content of the Heavy Nuclei. A. J. Dempster 2646
Heavy Electrons and Theories of Nuclear Phenomena. G. Wentzel 2647
Theory of Heavy Electrons and Nuclear Forces. H. J. Bhabha 2648
Application of " Reciprocity " to Nuclei. M. Born 2649
Attempt at a Theory of the Nucleus. F. J. Wiśniewski 2650
Interaction Energy in Electrodynamics and in the Field-Theory of Nuclear Forces. E. C. G. Stueckelberg 2710
Quantum Theory and the Atomic Nucleus. N. Bohr 2712
Passage of Very High Energy Particles through Atomic Nuclei. W. Heisenberg 2999
Saturation Requirements for Nuclear Forces. G. Breit and E. Wigner 3043
Stability of Nuclear Isomers. M. H. Hebb and G. E. Uhlenbeck 3044
Energy Loss of Elementary Particles with Integer Spin. E. C. G. Stueckelberg 3045
Passage of Particles through Spherical Potential Barriers. G. Badarau 3432
Constitution of Atomic Nuclei. A. Véronnet 3433
Structure of Atomic Nuclei. F. J. de Wiśniewski 3434
Interaction Forces in Electrodynamics and in the Field Theory of Nuclear Forces. E. C. G. Stueckelberg 3435
Charge-Dependence of Nuclear Forces. N. Kemmer 3436
Formation of Deuterons by Proton Combination. H. A. Bethe and C. L. Critchfield 3834
Probability of Radiative Transitions in Nuclei. B. Pontecorvo 3882
Deviation of the Nuclei of $^4_2$He and $^{16}_8$O from the Hartree Model. B. O. Grönblom 3883
Nuclear Transformations as the Source of Stellar Energy. G. Gamow 3999
Structure of Matter. Part I. G. Fournier 4270
Composition of Matter. R. Grégoire 4271
Coulomb Energy of Light Nuclei. H. A. Bethe 4272
α-Particle Model of the Nucleus. L. R. Hafstad and E. Teller.... 4735
Binding Energy of Li^6. H. Margenau and K. G. Carroll 4736

2. Isotopes and Isobares.

Mass-Spectrography and Nuclear Structure. J. Mattauch 3
Mass-Spectrograph Employing the Parabola Method and Relative Abundance of Argon Isotopes. W. Schütze 4

For the **Key** to this Index see pp. 1182 to 1194.

Atomic and Molecular Structure, *continued.*

	Abstract Nos.
Second-Order Focusing Mass-Spectrograph and Isotopic Weights by the Doublet Method. F. W. Aston	5
Solubility of D_2 and H_2 in Solid Pd. A. Sieverts and W. Danz	71
Radioactive Isotopes of Bromine. A. H. Snell	139
Resistance and Magnetic Susceptibility of D_2-Charged Palladium. A. Sieverts and W. Danz	307
First Report of the Committee on Atoms of the International Union of Chemistry. F. W. Aston, N. Bohr, O. Hahn, W. D. Harkins and G. Urbain	394
Isotopic Constitution of Snow and Mountain River Water. A. E. Brodsky, O. C. Scarre, E. I. Donzowa and M. M. Sluckaia	395
Indication of a Genetic Relation Between Indium and Tin. E. D. Eastman	396
Enrichment of Rubidium Isotopes. W. Walcher	397
Separation of Lithium Isotopes. L. Holleck	398
Mass Ratio of the Carbon Isotopes from the Spectrum of CN. F. A. Jenkins and D. E. Wooldridge	399
Thermal Properties of Heavy Hydrogen. K. Clusius	774
Thermal Properties of Heavy Water. E. Lange	775
Estimation of Deuterium. P. Harteck	794
Atomic Physics. C. H. Collie	901
Optical Rotatory Power of l-Menthol in Heavy Methyl Alcohol. E. Ogawa	1166
Absorption Spectra of Chromium Complexes Containing D_2O and ND_3. B. Duhm	1198
Isotopic Constitution of Calcium, Titanium, Sulphur and Argon. A. O. Nier	1371
Ratio C^{12} : C^{13} of Isotopes in Diamond. R. Frerichs	1372
Manipulation of the Farkas Microthermal Conductivity Analysis Apparatus. H. F. Walton	1373
Electrolytic Separation of Deuterium ; Influence of Temperature and Current Density at Various Kathode Metals. H. F. Walton and J. H. Wolfenden	1724
Isotope Abundance and Atomic Weight of Rubidium. A. K. Brewer	1762
Mass-Spectrograph of High Intensity and the Separation of the Isotopes of Rubidium. W. Walcher	1763
Nuclear Isomers of In^{116}. A. C. G. Mitchell and L. M. Langer	1764
Use of Interference Spectrographs for the Study of Fine Structures in Molecular Spectra. S. Imanishi	2033
Predissociation of Isotopic Molecules. E. Olsson	2045
Isotopic Constitution of Gadolinium, Dysprosium, Erbium and Ytterbium. A. J. Dempster	2207
Separation of Gaseous Isotopes by Diffusion. R. Sherr	2208
Mass Numbers of Stable Isotopes of Elements 43, 61, 85 and 87. R. Grégoire	2651
Formation of ^5_2He by Collisions between Helions and Deuterons. F. Joliot and I. Zlotowski	2825
Binding Energies of Hydrogen Isotopes. A. H. Wilson	3437
Isotope Abundance of Common Lead. A. O. Nier	3438
Fractionation of Li and K Isotopes by Chemical Exchange with Zeolites. T. I. Taylor and H. C. Urey	3439
Isotopic Constitution of Sr, Ba, Bi, Tl and Hg. A. O. Nier	3440
Densities of D_2O and H_2O : Electrolytic Separation of Oxygen Isotopes. L. Tronstad and J. Brun	3489
Density of Tap-Water from Osaka, Japan, and Cambridge, U.S.A. T. Titani and N. Morita	3490
Isotopic Ratio in Ordinary Water. N. Morita and T. Titani	3491
Separation of Isotopes. F. W. Aston	3884
New Method for Separating Isotopes. A. Kastler	3885
Separation of Hydrogen Isotopes in Photochemical Liberation from Aqueous Solutions. A. Farkas and L. Farkas	4098
Separation of Isotopes for Investigation of Nuclear Transformations. E. L. Yates	4273
Beryllium Isotopes of Mass 8. O. Laaff	4450

3. Periodic System.

M-Series of Elements from Cd(48) to Ce(58). H. Kiessig	4159
Extension of Periodic Table and Elements beyond Uranium. P. Ray	4274

For the **Key** to this Index see pp. 1182 to 1194.

Atomic and Molecular Structure, *continued.*

4. Valency.

Abstract Nos.

Valencies of Carbon. R. Truchet 400
Energetical Interpretation of the Semipolar Double Bond. R. Samuel 401
Infra-Red Spectroscopic Examination of Intermolecular Bonds. J. Errera 702
Determination of Binding Moment by Infra-Red Absorption Measurements. R. Mecke 707
Bond Character and Interatomic Distance. J. M. Robertson 1374
Properties of Carbon-Halogen Bond in Aliphatic Compounds. J. M. Stevels 1375
Resonance and Mesomerism. C. K. Ingold 1376
Numerical Valency in Polyatomic Molecules. H. Lessheim and R. Samuel 1765
Distribution of Metallic Electrons in the Alkali Metals. P. Gombás 1766
Spectroscopy and Valency. Part VI. R. W. Berriman and C. H. D. Clark 2901
Influence of Chemical Binding on X-Ray Absorption Spectra. R. Landshoff 2918
Hexacoordination in Telluric Acid, and in Molybdates and Tungstates in Solution. J. Gupta 4275
Valency and Covalency of Ruthenium in the Blue Chloride Solution. L. W. N. Godward and W. Wardlaw 4276
Maximum Valency and Atomic Structure. B. Ormont 4277

5. Molecular Structure. (*See also* Spectroscopy).

Formation and Structure of Polymers of the Insoluble Cross-Linked Type. R. G. W. Norrish and E. F. Brookman 6
Molecular Structures of Boron Compounds. H. A. Lévy and L. O. Brockway 7
Electron Diffraction Investigation of Seven Chlorobenzenes. L. O. Brockway and K. J. Palmer 8
Quantum Theory of Polarisability of Atoms and Ions in the Inhomogeneous Electric Field. H. Hellmann and S. J. Pschejetzkij 65
Parachor of NO_3F. D. G. Hill and L. A. Bigelow 84
Electron Diffraction Investigation of Nitrosyl Chloride and Nitrosyl Bromide. J. A. A. Ketelaar and K. J. Palmer 402
Molecular Interactions and Chemical Affinity. P. Girard and P. Abadie 403
Molecular Interaction and Polarisability. A. Michels, J. de Boer and A. Bijl 404
Anisotropy of van der Waals Forces. J. H. de Boer, G. Heller 405
London-van der Waals Attraction between Spherical Particles. H. C. Hamaker 406
Configuration of Carbohydrates by Conductivity Measurements in Boric Acid Solution. H. T. Macpherson and E. G. V. Percival 827
Dielectric Polarisation and Form of CO_2 Molecule. K. L. Ramaswamy 903
Molecular Structure of Germanium Bromide. M. Rouault 904
Electronic Structure of Polyenes and Aromatic Molecules. Part IV. C. A. Coulson. Part V. G. W. Wheland. Part VI. W. G. Penney and G. J. Kynch 905
Molecular Structures of Ketene and Thiophosphoryl Chloride. J. Y. Beach and D. P. Stevenson 906
Interatomic Distances in Simple Polyatomic Molecules. G. B. B. M. Sutherland 907
X-Ray Analysis and Application of Fourier Series Methods to Molecular Structures. J. M. Robertson 908
Viscosity and Chemical Constitution. M. Souders, Jr. 999
Supersonics in Relation to Molecular Constitution. E. G. Richardson 1261
Polarities of Covalent Bonds. C. P. Smyth 1291
Molecular Structure of Gaseous ZnI_2 and CdI_2. O. Hassel and L. C Strömme 1377
Structure of Silicochloroform. M. H. Pirenne 1378
Molecular Structures of Isobutane, t-Butyl Chloride and t-Butyl Bromide. J. Y. Beach and D. P. Stevenson 1379
Heats of Combustion and Inner Molecular Arrangement. H. Dunken and K. L. Wolf 1676
Sound Velocity and Chemical Constitution. S. Parthasarathy 1696
Resonance in Urea and its Derivatives. Part II. Diamagnetics of Thio-Derivatives. A. Clow 1737
Structure of Electronic Shells of Diatomic Homopolar Molecules. W. M. Tschulanowsky 1767
Structure of B_2NH_7 and $B_3N_3H_6$ and of Dimethylamine. S. H. Bauer 1768

For the **Key** to this Index see pp. 1182 to 1194.

Atomic and Molecular Structure, *continued.*

Abstract Nos.

Infra-Red Absorption Studies of Hydrogen Bonds between Unlike Molecules. W. Gordy 2036
Free Radical of a New Type. Paramagnetism of the Perchlorate of Tritolylammėnium. P. Rumpf and F. Trombe. 2171
Structure of Tetraborane B_4H_{10} and the Pentaborane B_5H_{11}. S. H. Bauer 2209
Structural Formulæ of Unsaturated Hydrocarbons. M. Brutzcus 2210
Theory of Rotational Transformation. G. Hettner 2211
Stability of Free Radicals. C. E. H. Bawn 2212
Trimethylene Biradical. C. E. H. Bawn and R. F. Hunter 2213
Influence of Background on the Determination of Atomic Distances in Molecules by Electron Diffraction. C. Finbak and O. Hassel 2652
Molecular Structures of the Methyl Derivatives of Phosphorus and Arsenic. H. D. Springall and L. O. Brockway 2653
Determination of Spontaneous Diffusion in Solid Hydrogen from the Reaction Course of the Ortho-Para Transformation. E. Cremer 2690
Molecular Force and Viscosity of Gases. Weng Wen-Po 2747
Absolute Configuration of Optically Active Substances. W. Kuhn 2877
Possibility of Molecular Rotation in the Solid Forms of Cetyl Alcohol and Three Long-Chain Ethyl Esters. W. O. Baker and C. P. Smyth 2987
Molecular Structure of Selenium Dioxide Vapour. K. J. Palmer and N. Elliott 3046
Internuclear Distance in the Fluorine Molecule. L. O. Brockway 3047
Electronic Structure of the First Row Hydrides. G. W. King 3048
Electron Diffraction Study of Di- and Tri-Germane. L. Pauling, A. W. Laubengayer and J. L. Hoard 3441
Calculation of Polarisability of a Molecule. M. M. Biedermann 3816
Electron Diffraction Examination of Linear High Polymers. K. H. Storks 3886
Magnetic Properties and Structure of Manganous and Cobaltous Dipyridine Chlorides. D. P. Mellor and C. D. Coryell 3887
Molecular Structure of As_4O_6, P_4O_6, P_4O_{10} and $(CH_2)_6N_4$. G. C. Hampson and A. J. Stosick 3888
Structures of P and Si Compounds. L. O. Brockway and J. Y. Beach 3889
Structure of $AlCl_3$, $AlBr_3$ and AlI_3. K. J. Palmer and N. Elliott 3890
Molecular Structures of CF_4 and SiF_4. C. R. Bailey, J. B. Hale and J. W. Thompson 3891
Structure of Dihalogen Derivatives of Cyclohexane. J. G. Gudmundsen and O. Hassel 3892
Molecular Models of Dielectrics. L. Hartshorn 4209
Dipole Moments and Molecular Structure. E. Bergmann and A. Weizmann 4213
Deformation of Molecules in Condensed Phases and the Hydrogen Bond. E. Bauer and M. Magat 4278
Estimation of Atomic Distances in Halides AX_3 and AX_4 by means of Electron Diffraction. O. Hassel and A. Sandbo 4279
Scattering of X-Rays by Liquids, particularly Tertiary Aliphatic Amines. R. N. Bapat 4280
Structure of the Insulin Molecule. D. M. Wrinch and I. Langmuir 4301
Colour in Relation to Chemical Constitution. I. N. D. Dass and S. Dutt 4464
Calculation of the Ionisation Constants of Inorganic Oxygen Acids from their Structures. A. Kossiakoff and D. Harker 4660
Theory of Hydrogen Molecule. T. Inui 4737
Structure of PCl_5. M. Roualt 4738
Structure of S, V and Cr Compounds. K. J. Palmer 4739
Structures of Hexacarbonyls of Cr, Mo and W. L. O. Brockway, R. V. G. Ewens and M. W. Lister 4740
Structures of $MoCl_5$ and WCl_6. R. V. G. Ewens and M. W. Lister 4741
Colour and Chemical Constitution of Salts of Diphenyl Violuric Acid. S. Prakash and S. Dutt 4903
Relative and Absolute Configuration of Complex Tridiammino-Ions of Trivalent Cr, Co and Rh. F. M. Jaeger 4924

6. Allotropy.

Phosphorus at High Temperatures and Pressures. R. B. Jacobs 9
Debye-Scherrer Patterns of Germanium between 20° and 1110° Abs. H. Nitka 30
Allotropy of Neodymium. F. M. Jaeger, J. A. Bottema and E. Rosenbohm 1380
Allotropes of S. S. R. Das 3893

Atomic and Molecular Structure, *continued.*

Abstract Nos.
Atomic Distribution in Allotropic Forms of Phosphorus at Different Temperature. C. D. Thomas and N. S. Gingrich 4742

7. Association.

Molecular Association of Bromobenzene and Other Halogenated Benzene Derivatives. P. Trautteur 10
Temperature-Variation of Viscosity of Strongly Associated Liquids. B. Derjaguin and M. Kussakow 93
Frequency of Oscillations of the OH Group in Methyl Alcohol and its Dependence on Density. G. S. Landsberg and S. A. Ukholin 209
Dependence of the Combination Spectrum of Water on Density and Pressure. S. A. Ukholin 210
Gaseous Polymerisation and Equations of State. L. Herman 778
Magnetic Birefringence of Solutions of Pinenes in Benzene. J. Rabinovitch 1586
Constitution and Viscosity Association of High-Molecular Hydrocarbons. B. Yamaguchi 1879
Preparation for the Formation of New Phases. A. Smits 2086
Constitution of Heavy Water. I. R. Rao and P. Koteswaram 2654
Molecular Association Studied in the Infra-Red. J. Errera and H. Sack 2655
Dipole Interaction in Mixtures of Water with Methyl, Ethyl, and *n*-Propyl Alcohols, and of Ethyl Alcohol with *n*-Heptane. A. R. Martin and A. C. Brown 2953
Molecular Association of Acetic Acid. P. Koteswaram 3894
Raman Spectra and Structure of Associated Molecules of Organic Acids. V. Čelinzev 4148
Complexity of P_2O_5. A. Smits, J. A. A. Ketelaar and J. L. Meijering 4281
Complexity of Aluminium Chloride. A. Smits, J. L. Meijering 4282
Infra-Red Absorption and Association in Carboxylic Acids. A. M. Buswell, W. H. Rodebush and M. F. Roy 4530
Infra-Red Study of Acid Amide and Oxime Association. A. M. Buswell, W. H. Rodebush and M. F. Roy 4956
Infra-Red Study of Complex Formation Due to Hydrogen Bonding. A. M. Buswell, W. H. Rodebush and M. F. Roy 4957

8. Atomic and Molecular Magnitudes.

Mean Free Path of Transformation Particles. Masses of Light Nuclei, and Verification of Absorption Theories. G. Mano 11
Structure of H_3, H_3^+ and of H_3^-. D. Stevenson and J. Hirschfelder 12
Molecular Weight and Viscosity of Highly Polymerised Substances. A. Dobry 14
Osmotic Method for the Determination of Particle Weights in Colloidal Solutions. Wo. Ostwald 15
Atomic Masses of the Heavy Elements. A. J. Dempster 407
Atomic Weight of Lead and Pb/U Ratio in St. Joaquimsthal Pitchblende. G. P. Baxter and W. M. Kelley 909
Molecular Weight and Viscosity of Polymers. H. Staudinger. 1383
Isotope Abundance and Atomic Weight of Rubidium. A. K. Brewer 1762
Molecular Weights of Gases by the Method of Limiting Densities. E. Moles.. 1801
Determination of Molar Weights of Vapours near the Boiling Point. J. D. Ingle and H. P. Cady 1802
Eighth Report of Committee on Atomic Weights of International Union of Chemistry. G. P. Baxter, O. Hönigschmid and P. LeBeau 2214
Effect of Intermolecular Forces in Gases and Liquids. E. Steurer and K. L. Wolf 2524
Determination of the Vapour Densities of Indigo and Other Organic Compounds by means of a Spoon Gauge. C. E. Dent and R. P. Linstead.... 2686
Limiting Density of SO_2. E. Moles, T. Toral and A. Escribano 3064
Boiling Point and Chemical Constitution. Part I. An Additive Function of Molecular Weight and Boiling Point. V. C. E. Burnop 3323
Atomic and Ionic Radii. Part I and II. W. Hume-Rothery and G. V. Raynor. Part III. G. V. Raynor 3442
Limiting Densities of O_2 and CO_2. Atomic Weight of Carbon. E. Moles and A. Escribano 3486
Atomic Heat of Nitrogen in Nitrides. Part I. S. Satoh 3774
Molecular Weights of Globular Proteins. D. M. Wrinch 3895

Atomic and Molecular Structure, *continued.*

Abstract Nos.

Molecular Volumes and Parachors of Mercuric Halides and their Group Relationships. E. B. R. Prideaux and J. R. Jarratt ... 3981
Boiling Point and Chemical Constitution. Part II. Calculation of Degree of Association at the Boiling Point. V. C. E. Burnop ... 5001

10. Unclassified.

Experiments with Models to Determine the Ordinal State of Molecules in Liquids and in Gases of High Density. H. Rehaag and H. A. Stuart ... 461
Atomic Forces of the Solid State. Part VII. Weng Wen-Po ... 499
Formation of Mercury Molecules. Part II. F. L. Arnot and M. B. M'Ewen ... 910
Formation of Helium Molecules. F. L. Arnot and M. B. M'Ewen ... 2656
Intermolecular Forces. J. N. Friend ... 3443

Calorimetry.

1. Specific Heat:
    (*a*) Gases.
    (*b*) Liquids.
    (*c*) Solids.
2. Latent Heat:
    (*a*) Fusion.
    (*b*) Evaporation.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References:
Heat of Adsorption, *see* Surface Properties.
Heat of Combustion, Formation, Dissociation, Solution and Dilution, *see* Thermochemistry.
Thermodynamics of Specific Heat and Latent Heat, *see* Thermodynamics.

1. Specific Heat.

(*a*) *Gases.*

Heat Capacity of Gaseous Propane, *n*-Butane, Isobutane, and *n*-Pentane. B. H. Sage, D. C. Webster and W. N. Lacey ... 243
Ultrasonic Velocity in Gases Between 1 and 100 Atmospheres. A. H. Hodge 280
Ratio of Specific Heats of Air, N_2, and CO_2 as a Function of Pressure by the Ultrasonic Method. J. C. Hubbard and A. H. Hodge ... 281
Comparison of Specific Heats of Gases at Temperatures above the Surrounding Temperature. A. Potop ... 753
Low-Temperature Heat Capacity of Gaseous Ethane. G. B. Kistiakowsky and F. Nazmi ... 754
Molecular Heat, Heat of Fusion and Entropy of Fluorine. E. Kanda ... 1232
Molecular Heat of Organic Vapours. K. Bennewitz and W. Rossner ... 2494
Heat Capacity of Ethylene. D. B. Pall, J. W. Broughton and O. Maass ... 4162
Nuclear Spin and Symmetry Effect in the Heat Capacity of Ethane Gas. E. B. Wilson, Jr. ... 4976
Molecular Theory of Gases. Part II. M. Trautz. ... 4994

(*b*) *Liquids.*

Heat Capacity of Supercooled Liquid Glycerol. A. G. Oblad and R. F. Newton ... 755
Semi-Microcalorimeter for Heat Capacities at Low Temperatures. D. R. Stull 756
Molecular Potential Energy. P. Guareschi ... 1826
Molecular Heats of Liquids. P. Guareschi ... 1827
Specific Heats of Liquids in Relation to Raman Effect Data. S. Bhagavantam 2495
Calorimetric Measurements during Transition from the Anisotropic to the Isotropic Phase. C. Kreutzer ... 4306
Properties of Gaseous He at Liquid He Temperatures. A. van Itterbeek ... 4585
Specific Heat of Water (H_2O) Between 0° and 100° C. W. A. Roth ... 4977

(*c*) *Solids.*

Accommodation Coefficients of Noble Gases and Specific Heat of Tungsten. W. C. Michels ... 245
Entropy of Isoprene from Heat-Capacity Measurements. N. Bekkedahl and L. A. Wood ... 260
Molecular Heat of Methane in Solid Mixtures of Methane and Krypton. A. Eucken and H. Veith ... 1233
Heat Capacity of Diamond from 70 to 300° K. K. S. Pitzer ... 1234
Allotropy of Neodymium. F. M. Jaeger, J. A. Bottema and E. Rosenbohm ... 1380
Atomic Heats of Supraconducting and Non-Supraconducting Tin. W. H. Keesom and P. H. van Laer ... 1671

For the **Key** to this Index see pp. 1182 to 1194.

Calorimetry, *continued.*

Abstract Nos.

Heat of Formation and Specific Heat of Aluminium Carbide. S. Satoh 1677
Heat of Formation and Specific Heat of Silicon Nitride. S. Satoh 1678
Heat of Formation and Specific Heat of Vanadium Nitride. S. Satoh 1679
Specific Heats of Zirconium Nitride and Magnesium Nitride. S. Satoh 2496
Specific Heat of Pure Fe. A. J. Zuithoff 2497
Low-Temperature Calorimeter. Heat Capacity and Entropy of Thallium from 14 to 300° K. J. F. G. Hicks, Jr. 2924
Heat of Formation and Specific Heat of Tantalum Nitride. S. Satoh 2943
Transformations of Solid CD_4 and of its Mixture with CH_4. E. Bartholomé, G. Drikos and A. Eucken 2949
Heat Capacities of Crystals at Low Temperatures. S. C. Sirkar and J. Gupta 3293
Thermal Data of Solid and Liquid SO_2. W. F. Giauque and C. C. Stephenson 3294
Specific Heats and Heat of Fusion of Iodine. K. J. Frederick and J. H. Hildebrand 3295
Heat of Formation and Specific Heat of Calcium Nitride. S. Satoh 3311
Atomic Heat of Nitrogen in Nitrides. Part I. S. Satoh 3774
Specific Heats of Beryllium, Phosphorus and Titanium Nitrides. S. Satoh.. 4163
Specific Heat of Nickel. C. Sykes and H. Wilkinson 4164
Normal Modes and Frequencies of the Sulphur Molecule. S. Bhagavantam and T. Venkatarayudu 4552
Raman Spectrum and Specific Heat of Sulphur. S. Bhagavantam and T. Venkatarayudu 4553
Normal Frequencies of Phosphorous (P_4). S. Bhagavantam and T. Venkatarayudu 4554
Specific Heat-Temperature Curves of Age-Hardening Alloys. N. Swindells and C. Sykes 4576
Heat of Formation and Specific Heat of Chromium Nitride. S. Satoh 4587
Heat Capacity of Bi. H. L. Bronson and L. E. MacHattie 4978
Specific Heats and Heat of Fusion of $TeCl_4$. K. J. Frederick and J. H. Hildebrand 4979
Low-Temperature Heat Capacity Measurements on BF_3, CF_4 and SF_6. A. Eucken and E. Schröder 4980

2. Latent Heat.

(*a*) *Fusion.*
Molecular Heat, Heat of Fusion and Entropy of Fluorine. E. Kanda 1232
Paramagnetism of Electrons in a Rectangular Band. L. Néel 3395
Specific Heats and Heat of Fusion of $TeCl_4$. K. J. Frederick and J. H. Hildebrand 4979
Low-Temperature and Heat Capacity Measurements on BF_3, CF_4 and SF_6. A. Eucken and E. Schröder 4980
Latent Heat of Fusion of Aluminium. J. H. Awbery 4981
(*b*) *Evaporation.*
Physical Constants of Krypton. E. Mathias, C. A. Crommelin and J. J. Meihuizen 438
Fusion Point, Vapour Pressure and Heat of Evaporation of Vanadium Oxytrichloride. H. Flood, J. Gørrisen and R. Veimo 765
Theory of X-Ray Absorption and Heat of Sublimation of Zinc. M. Satô...... 1668
Determination of Molar Weights of Vapours near the Boiling Point. J. D. Ingle and H. P. Cady 1802
Molecular Heat of Organic Vapours. K. Bennewitz and W. Rossner 2494
Vapour Pressure of Propane. P. Harteck and R. Edse.................... 3789

4. Unclassified.

Calorimetric Measurements on Refrigerants. A. Perlick 758
Regulation of Heat Loss from the Human Body. J. D. Hardy and E. F. DuBois 763
Physical Laws of Heat Loss from the Human Body. J. D. Hardy 764
Heat. R. W. Powell 1243
Heat Produced by the Internal Deformation of a Block of Lead Influenced by its Own Weight. W. Świętoslawski, L. Keffler and J. Salcewicz 2498
Distribution of Frictional Heat between Two Bodies. F. Charron.......... 3296

For the **Key** to this Index see pp. 1182 to 1194.

Colloids.

1. Theory.
2. Sols:
   - (*a*) Formation and Composition.
   - (*b*) Optical Properties.
   - (*c*) Viscosity and Mechanical Properties.
3. Gels:
   - (*a*) Formation and Composition.
   - (*b*) Optical Properties.
   - (*c*) Viscosity and Mechanical Properties.
   - (*d*) Swelling, Shrinking, Synaeresis.
   - (*e*) Membranes.
4. Fibres.
5. Emulsions and Suspensions.
6. Electrical Properties (Coagulation, Kataphoresis, Electroosmosis, etc.).
7. Structure.
8. Apparatus, *see* Supplementary Index.
9. Unclassified.

Cross-References:
Brownian Motion, *see* Kinetic Theory of Matter.
Surface Phenomena, *see* Surface Properties.

2. Sols.

Abstract Nos.

(*a*) *Formation and Composition.*
Formation and Solvation of Two-Dimensional Colloids. P. F. Pokhill, T. J. Silberman and D. L. Talmud 1381
Hydrosol of the Magnetic Oxide of Iron. T. Katsurai 1382
Preparation of Alumina Hydrosols. M. A. Miller 1770
Colloidal Silver. R. Spychalski 2657
Viscosity and Jelly Formation of Concentrated Sols of Hydrous Stannic Oxide. C. I. Varadanam 3049
Dispersion of Solids in Liquids by Supersonic Waves. K. Söllner 4181
Nuclear Gold Sols. Part I. Determination of Particle Size. F. L. Usher 4283
Colour and Nature of Solutions of Na in Liquid NH_3. F. Krüger 4284
Formation of Gold Sols in Alkaline Solutions. L. L. Bircumshaw 4743
Production of Aerosols by Spraying Solutions. G. Jander and E. Wygasch .. 4744

(*b*) *Optical Properties.*
Applicability of the Mie Effect for the Determination of Particle Size in Aerosols. H. Engelhard and H. Friess 21
Influence of the Size of Colloidal Particles on their Optical Anisotropy. W. Heller 408
Dynamic Birefringence of Colloids (Maxwell Effect). Influence of Solvents. C. Sadron 911
Polarisation of Light Transmitted by Colloidal Solutions. A. Boutaric and L. Bernard 912
Absorption and Scattering of Light in Hydrophobic Colloids. Part II. F. B. Gribnau 913
Reciprocity Theorem in Colloid Optics. R. S. Krishnan 1623
Absorption and Scattering of Light in Hydrophobic Colloids. Part III. F. B. Gribnau 1771
Reciprocity Theorem in Colloid Optics. R. S. Krishnan 2009
Light-Scattering in Emulsions. Part I. R. S. Krishnan 2010
Light Scattering by Rubber Sols in Media of Different Polarities. V. Margaritov and B. Kovarskaia 2215
New Light Source for Photographic Untramicroscopy. K. Hoffmann 2216
Turbidity and Particle-Concentration of As_2S_3 Sols during Coagulation. K. Hoffmann and H. A. Wannow 3050
Maintaining Transparency in Glass Observation Windows. C. W. Ockelford 3281
Dispersion of Depolarisation of Light-Scattering in Colloids. R. S. Krishnan 3444
Molecular Aggregation and Light Scattering. R. S. Krishnan 3445
Optical Properties of Cellulose Dispersed in Cuprammonium Hydroxide. J. Compton 3896
Influence of Dispersity on Dynamic Birefringence of Colloids. C. Sadron 4745
Dynamic Birefringence of Polydisperse Systems. C. Sadron and H. Mosimann 4746

(*c*) *Viscosity and Mechanical Properties.*
Viscosity of Colloidal Solutions of Arsenious Sulphide. A. Boutaric and S. Thévenet 13
Molecular Weight and Viscosity of Highly Polymerised Substances. A. Dobry 14
Osmotic Method for the Determination of Particle Weights in Colloidal Solutions. Wo. Ostwald 15
Solvation of Rubber in Dispersion Media of Different Polarities. V. B. Margaritov 410
Frictional Dispersion of the Dielectric Constants of Organic Fluids. E. Plötze 834

Colloids, *continued.*

Abstract Nos.

Isothermal and Reversible Immobilisation of Particles in Thixotropic Sols. W. Heller and G. Quimfe ... 914
Effect of Orientation of Non-Spherical Colloidal Particles on their Velocity of Aggregation. W. Heller and G. Quimfe ... 915
Molecular Weight and Viscosity of Polymers. H. Staudinger ... 1383
Viscosity of Highly Polymerised Compounds. I. Sakurada ... 1772
Viscosity of Lyophilic Vaseline Colloid in Sodium Oleate Solution. C. Rossi 2217
Agglomeration and Viscosity in Dilute Suspensions. G. Broughton and C. S. Windebank ... 2218
Thermomechanical Properties of Rubber Sols. V. Margaritov ... 2219
Influence of Supersonic Waves on the Viscosity of Colloidal Solutions. H. Freundlich and D. W. Gillings ... 2220
Effect of Supersonic Waves on Solutions of Highly Polymerised Substances. E. Thieme ... 2221
Flow of Viscous Substances. W. Philippoff ... 2658
Diffusion of Cellulose Derivatives. A. Polson ... 2659
Effect of Electrolytes on the Viscosity of $Fe(OH)_3$ Sol. S. Thévenet ... 3446
Viscosity Function of Disperse Systems. F. Frimberger and J. Rehme ... 3897

3. Gels.

(*a*) *Formation and Composition.*
Silica Jellies. Part I. H. W. Batchelor ... 3051
Optical Study of Isothermal and Non-Isothermal Sol → Gel Transformations. W. Heller and E. Vassy ... 3447
Ferromagnetic Gels. T. Katsurai and K. Yamasaki ... 4285
(*b*) *Optical Properties.*
Isothermal and Reversible Absorption in Thixotropic Solutions. W. Heller and G. Quimfe ... 16
(*c*) *Viscosity and Mechanical Properties.*
Viscosity of Liquids. G. I. Taylor, J. D. Bernal, A. S. C. Lawrence, E. N. da C. Andrade, E. Hatschek, R. K. Schofield ... 90
Anomaly in Elastic Behaviour of India Rubber. A. N. Puri ... 409
Load-Compression Characteristics of Gelatins, Fibres and Other Materials. E. J. Saxl ... 1384
Constitution of a Thermoreversible Gel. F. Hirata ... 1773
Ultracentrifugal Study of Gelatin. E. B. Sanigar, L. E. Krejci and E. O. Kraemer ... 2222
Natural and Artificial Rubber: Elasticity of Long-Chain Molecules. H. Mark 2223
Stretching of Heated Polystyrene Films. G. van Iterson, Jr. and K. E. C. Buyn 4747
(*d*) *Swelling, Shrinking, Synaeresis.*
Recent Work on Gels. H. Freundlich ... 17
Measurement of Thixotropy in Absolute Units. C. F. Goodeve and G. W. Whitfield ... 1385
Dilatometric Study of Colloidal Gels. A. Boutaric ... 1774
Isoelectric Point of Cellulose. Adsorption and Swelling. J. Gavoret ... 2224
Sedimentation Volume and Thixotropy. H. Akamatu ... 3448

4. Fibres.

Bonding Force of Cellulosic Materials for Water. A. J. Stamm and L. A. Hansen ... 18
Solution States of the Celluloses. T. Lieser ... 19
Stress-Strain Characteristics of Wool as Related to its Chemical Constitution. A. M. Sookne and M. Harris ... 20
Spinnability of Liquids. H. Erbring ... 1386
Structure of Cellulose and Rubber. H. Mark and K. H. Meyer ... 1389
Form Assumed by a Steadily Rotating Thread. H. W. Hall and W. Hunter ... 1424
Intensity Distribution in the Fibre Diagram. Y. Go, S. Nagata and J. Kakinoki ... 1775
Micellar Structure of Cellulose. O. Kratky and F. Schoszberger ... 2225
Structure of Hair, Wool and Related Fibres. Part IV. H. J. Woods ... 2226
Lyophilic Properties of Cellulose Derivatives. K. Kanamaru, T. Takada and K. Maeda ... 3449
Hydrophilic Properties of Cellulose. Part VI. K. Kanamaru, A. Shiratori and T. Nakamura ... 3450

For the **Key** to this Index see pp. 1182 to 1194.

Colloids, *continued.*

Abstract Nos.

Test of Alternative Structures Proposed for Cellulose. S. T. Gross and G. L. Clark 3451

5. Emulsions and Suspensions.

Applicability of the Mie Effect for the Determination of Particle Size in Aerosols. H. Engelhard and H. Friess 21
Recent Work on Aerosols (Dust, Smoke, Fog). W. L. H. Moll 22
Spontaneous Emulsification and Reactions Overshooting Equilibrium. J. W. McBain and Ts-Ming Woo 23
Sedimentation Rate and Equilibrium in Centrifuges and Opaque Ultra-Centrifuges. J. W. McBain 916
Dilatancy and its Relation to Thixotropy. H. Freundlich and H. L. Röder 917
Supersonic Absorption in Smokes. T. J. Laidler and E. G. Richardson 1259
Viscosity of Oil-Water Emulsions. G. Broughton and L. Squires 1387
Preparation, Properties and Particle Size of Mineral Suspensions, with Special Reference to Graphite. E. Hoffmann 2227
Emulsoidal State of Binary Liquid Systems above the Critical Miscibility Temperature. J. Frenkel 2228
Properties of Dual Emulsions. D. F. Cheesman and A. King 2229
Stability of Dispersions. J. C. Carruthers 2230
Process of Diffusion in a Centrifugal Field of Force. W. J. Archibald 2254
Adsorption on Curved Surfaces and Emulsification. H. M. Cassel 2299
X-Ray Examination of Fine Particles and Colloidal Suspensions. A. Guinier 2660
Process of Diffusion in a Centrifugal Field of Force. Part II. W. J. Archibald 3919
Thixotropic and Plastic Behaviour of Suspensions of Barium Sulphate with Clay. B. Tamamushi and Y. Sekiguchi 4286
Water-in-Oil Emulsions. Part I. R. C. Pink 4287
Optical Properties of Liquid Suspensions. L. Amy 4462
States of Dust. O. Brandt 4748
Constant of Sedimentation by Ultracentrifuge. M. Paić 4749
Viscosity of Starch Pastes. J. R. Katz, M. C. Desai and J. Seiberlich 4832
Formation of Surfaces in Liquid-Liquid Mixtures. W. W. Lepeschkin 4999

6. Electrical Properties (Coagulation, Kataphoresis, Electroosmosis, etc.)

H.F. A.C. Electroosmosis between Plane Parallel Walls. L. Rosenhead, J. C. P. Miller and J. J. Bikerman 24
H.F. Conductivity of Colloidal Electrolytes. G. Schmid and T. R. Aalts 312
Dielectric Measurements on Hydrophilic Colloids. Part II. P. J. Denekamp and H. R. Kruyt 317
Colloidal Formations and Electrophoretic Phenomena on Metals. L. I. Beljajev 411
Dielectric Constant and Particle Size. N. M. Li and J. W. Williams 832
Dielectric Measurements of Hydrophilic Colloids. Part III. H. R. Kruyt and J. T. G. Overbeek 833
Electrochemistry of Platinum Sols. Part III. N. A. Balaschowa and N. Bach 918
Action of Hydrochloric Acid on Colloidal Silicic Acid. V. N. Krestinskaja and N. E. Natanson 919
Ratio of Electroosmotic to Electrophoretic Mobility. H. L. White and L. Fourt 920
Electrophoresis of Hydrocarbons and Simple Derivatives as a Function of pH. J. C. Carruthers 921
Charged Colloid Particles in an Ultrasonic Field. J. J. Hermans 1388
Ratio of Electroosmosis to Electrophoresis. L. S. Moyer 1776
Mobility Studies with Colloidal Silicic Acid. F. Hazel 1777
Adsorption in the Coagulation of Sols by Electrolytes. H. B. Weiser, W. O. Milligan and W. J. Coppoc 1778
Electrolysis of Colloidal Silver Solutions. M. Centnerszwer and J. Borowicz 2231
Flow Potentials, Electro-Endosmosis and Electrophoresis with Platinum. H. R. Kruyt and J. Oosterman 2661
Surface Electrification Due to the Recession of Aqueous Solutions from Hydrophobic Surfaces. I. Langmuir 2740
Measurement of Superficial Electric Moments in the Midst of a Liquid. N. Choucroun and M. Arditi 2741
Electrokinetic Potential. Parts I and II. K. Kanamaru, T. Takada and K. Aikawa 3052

Colloids, *continued.*

Abstract Nos.

Theory of Electroosmotic Circulation in Varying Fields. P. White 3053
Action of Ionising Radiations on Colloidal Graphite. J. A. Crowther, H. Liebmann and R. Jones 3292
Electrokinetic Properties of Activated Charcoal. H. L. Bennister and A. King 3452
Electrophoretic Mobility of Tristearin in Presence of Chlorides. D. I. Breese and W. C. M. Lewis 3453
Source of Error in Micro-Kataphoretic Measurements with a Cell of Cylindrical Bore. D. C. Henry 3898
Electrochemistry of Congo-Dye Sols. W. Pauli and P. Szarvas 3899
Electrodialysis. H. de Bruyn and S. A. Troelstra 3900
Conductivity Anomalies in Molecular and Colloidal Disperse Solutions. K. Hoffmann 4288
H.F. Conductivity of Colloidal Electrolytes. G. Schmid and E. C. Larsen.... 4641
Kataphoresis and Sedimentation Potential. J. J. Hermans 4750
Charged Colloid Particles in an Ultrasonic Field. Part II. J. J. Hermans.... 4751

7. Structure.

Rhythmic Precipitation in Electric Field. Part II. T. Okaya and K. Ohmori 412
New Method for Producing Liesegang Rings in Gels. J. Obrist 413
Liesegang Rings with Uric Acid. H. Knöll 922
Structure of Cellulose and Rubber. H. Mark and K. H. Meyer.... 1389
Structure of Stretched Rubber. C. J. B. Clews and F. Schoszberger.... 1390
X-Ray Study of Stretched Rubber. H. A. Morss, Jr. 1391
X-Ray Adventures among the Proteins. W. T. Astbury 1392
Wave Nature of the Periodic Reaction of Silver Bichromate. V. K. Nikiforov and S. S. Kharamonenko 1393
Intensity Distribution in the Fibre Diagram. Y. Go, S. Nagata and J. Kakinoki 1775
Structure of Thixotropic Systems. B. Tamamushi 1779
Rhythmic Precipitation in an Electric Field. Part III. T. Okaya 1780
Structure of Living Materials. G. L. Clark 1781
Physical Properties of Protoplasm. E. N. Harvey.... 1782
Optical Studies of the Molecular Organisation of Living Systems. F. O. Schmitt 1783
X-Ray Spectra, Double Refraction and Viscosity of Sols in Motion. K. Hess, H. Kiessig and W. Philippoff 1784
Crystallisation of Rubber through Pressure. P. A. Thiessen and W. Kirsch.. 3454
Molecular Weights of Globular Proteins. D. M. Wrinch 3895
Silver Chromate Banding in Silicic Acid Gel. T. Isemura 3901
Calcium Phosphate Banding in Silicic Acid Gel. T. Isemura 3902
Quantitative Investigations on Rhythmic Precipitation. K. Neumann and V. Costeanu 3903
Colloidal Structure of Rubber in Solution. S. D. Gehman and J. E. Field .. 4289
Optical and Dimensional Changes in Freezing and Melting of Rubber. W. H. Smith and C. P. Saylor 4290
Crystallisation in Stretched Rubber. P. A. Thiessen and W. Wittstadt 4291
X-Ray Diffraction Studies on Heavy-Metal Ferrocyanide Gels. H. B. Weiser, W. O. Milligan and J. B. Bates 4752
Hydrous Oxide Hydrosols and Gels. A. Ganguli 4753

9. Unclassified.

Disperse Gases. Part III. W. Luchsinger 26
Effect of Ultrasonic Waves on Solubility of Colloids. Part III. N. Sata .. 27
London-van der Waals Attraction between Spherical Particles. H. C. Hamaker 406
Effect of Ultrasonic Waves on Colloidal Phenomena. Part IV. N. Sata and Y. Niwase 415
Application of the Electron Microscope in Biology. F. Krause 869
Electron Microscope in Colloid Investigations. D. Beischer and F. Krause .. 870
Differential Equation of Ultracentrifuging. S. Oka 923
Two Possible Orientations of Colloidal Goethite in the Magnetic Field. W. Heller and G. Quimfe 924
Magnetic Properties of Tellurium on Colloidalisation. M. Prasad and S. S. Dharmatti 2169
Heat Content of Colloidal Gold. R. Fricke and F. R. Meyer 2232

Colloids, *continued.*

Abstract Nos.

State of Solution of Soaps. Part I. Specific Volume of Dilute Sodium Oleate Solutions. M. Ulmann 2663
Chemical Properties of Aerosols. R. E. Liesegang 2664
Crystal Size in Metal and Metal-Oxide Smokes. D. Beischer 2665
Trajectory of Ash Particles in Air and the Determination of their Size. K. Prosad and D. N. Sen 2666
Growth of Metal Trees in Gels. A. King and N. Stuart 2995
Linear Adsorption on Two-Dimensional Colloids. P. F. Pochil, T. I. Silberman and D. L. Talmud 3114
Emission of Short U.V. Radiation during Structure Formation. Part I. Radiation during Typical Coagulations. A. Rabinerson and M. Filippov 3215
Method of Ascertaining and Defining Fineness of Powder. I. Iitaka and R. Shiota 3942
Retention of Vapours by Active Gels. F. Krczil, F. Schätzler and E. Brixel 3968
Size of Paraffin-Chain Salt Micelles from Diffusion Measurements. G. S. Hartley and D. F. Runnicles 4773

Properties, Formation and Measurement of Finely Divided Powders. A. Winkel 780B
Protection against Corrosion by Colloidal Graphite. F. Pavelka 1471B
Composition and Structure of Hevea Latex. A. R. Kemp 1159B

Colorimetry.

1. Theory.
2. Apparatus, *see* Supplementary Index.
3. Unclassified.

Cross-Reference:
See also Vision.

1. Theory.

Accuracy of Trichromatic Colour Measurements. F. Lindmaier 620
Chromaticity Limitations of the Best Physically Realisable Three-Filter Photoelectric Colorimeter. J. A. van den Akker 621
Luther Condition in Colour Measurement. M. Richter 1131
Space Coordinates of the Vectors for Colour Production. H. E. J. Neugebauer 1132
Colour of Outdoor Photographic Subjects. F. H. G. Pitt and E. W. H. Selwyn 1584
Colour Charts in Photography. E. R. Davies and E. W. H. Selwyn 1585
Intrinsic Properties of the Colour Domain. L. Silberstein 1969
Photometric Relationships between Complementary Colours. D. L. MacAdam 2410
Minimum Perceptible Colorimetric Purity as a Function of Dominant Wave-Length. I. G. Priest and F. G. Brickwedde 2411
Attributes of Colours and Colour Measurement. W. Ostwald 3208
Objective Measurement of Colour. J. W. Perry 3657
Hue-Difference Sensitivity and Schrödinger's Theory. J. Rosenmann 4070
Correlation of Colour Temperatures Based on the Wien and Planck Formulæ. R. S. Estey 4071
Ideal Colour System. Part II. Reconsideration of the Helmholtz Line Element. R. H. Sinden 4465
Problems of Photometry and Colorimetry. J. Dourgnon 4921

3. Unclassified.

Subjective Study of Colour Mixtures. V. H. Pavlović 153
Determination of Phosphate by Photoelectric Colorimetry. W. J. Dyer and C. L. Wrenshall 2413
Photographic Colorimetry of Dark Surfaces. E. v. Angerer and J. O. Brand 4467
Artificial Daylight. R. Toussaint 4904

Comets and Meteors.

1. Comets.
2. Meteors.

1. Comets.

Comet Wolf I in 1933–1934. M. Kamieński and M. Bielicki 96
Observations of Comets 1937 b, c, and f. W. H. Steavenson 509

Comets and Meteors, *continued.*

Abstract Nos.

Spectroscopic and Photometric Observations of Comet Finsler (1937 f). A. Colacevich 1009
Visible Spectrum of Comet Finsler. J. Gauzit 1010
Rapid Changes in the Tail of Comet Finsler. J. Ellsworth 1501
Comet 1936 a (Peltier). G. L. Andrissi 1502
Comets. A. C. D. Crommelin 1884
Interpretation of the Variable Structures of Cyanogen in Cometary Spectra. K. Wurm 1885
CH Bands and the Presence of Hydrogen in Comets. M. Nicolet 1886
Presence of the First Positive Group of Nitrogen in the Spectrum of Comet Finsler (1937, f). J. Gauzit 1887
Photographs of Comet Finsler (1937 f). F. I. Blumbach 3130
Spectrum of Comet Finsler (1937 f). D. R. Barber 3131
Spectrum of Cometary Nuclei and Bands of Molecule CH. J. Dufay 3132
Structure of the Violet Bands of Cyanogen in Cometary Spectra. J. Dufay 3574
Intensity Distribution in the Bands of Cometary Spectra. P. Swings and M. Nicolet 3987
Motion of Periodic Comet Kopff (1906e). F. Kepiński 4834

2. Meteors.

Cosmic Nature of Telescopic Meteors. I. S. Astapowitsch 97
Spectrum of a Bright Meteor. C. Schalén and G. Wernberg 1011
Arizona Expedition for Study of Meteors. Part VI. E. Öpik 1012
Meteor Photographs Taken through a Rotating Shutter. P. M. Millman and D. Hoffleit 1013
Distribution of Meteoric Masses in Interstellar Space. F. Watson, Jr. 1014
Real Paths of Fireballs. R. A. McIntosh 1015
Cosmic Radiation and Activity of Meteors. J. Zirkler 1135
Building of Larger Bodies from Small Particles in Interstellar Space. A. Corlin 2318
Physics of Meteoric Phenomena. M. A. R. Khan 3575
Astrophysics at North Pole. B. G. Fessenkoff 4416
Origin of Zodiacal Light. B. G. Fessenkoff 4417

Conduction (Electric) and Discharge in Gases.

1. Theory.
2. Conduction at Higher Pressures (Order of one Atmosphere). Spark and Arc. Mobility of Ions. Recombination of Ions.
3. Low-Pressure Discharge. Dark Space. Kathode Fall of Potential. Negative Glow. Positive Column. Electrodeless Discharge.
4. Ionisation by Electron Impact. Critical Potentials.
5. Ionisation by Collision with Atoms and Ions.
6. Ionisation by Chemical Action.
7. Positive Rays (Canal Rays). Anode Rays.
8. Chemical Effects of Discharge.
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References:
Auto-Electronic Emission, *see* Thermionics.
Diffraction, Scattering, Reflection, etc., of Electrons; Electron Optics; Kathode-Ray Oscillographs; Secondary Emission; *see* Electrons, etc.
Luminous Effects, *see* Spectroscopy.

1. Theory.

Theory of Motion of Electrons in Gases and Semiconductors. B. Davydov 287
Thermodynamics of Ionisation. K. H. Riewe 806
Theory of Pressure-Ionisation and its Applications. D. S. Kothari 1911
Energy Balance for an Infinitely Small Electron Current in a Uniform Electric Field. F. M. Penning 2110
Statistical Theory of a Scaling Circuit. L. Alaoglu and N. M. Smith, Jr. 2836
Conductivity and Dielectric Constant of an Electron Stream. H. E. Hollmann and A. Thoma 3797
Generalisation of the Theory of Electrical Discharges. J. S. Townsend and E. W. B. Gill 4190
Wall Potential in the Diffusion Column. W. Funk and R. Seeliger 4622

Conduction (Electric) and Discharge in Gases, *continued.*

2. Conduction at Higher Pressures (Order of one Atmosphere). Spark and Arc. Mobility of Ions. Recombination of Ions.

Abstract Nos.

Influence of Electric and Magnetic Fields on Electric Sparks in Air at Atmospheric Pressure. L. Bull and P. Girard 288
Nature of the Oscillating Spark Discharge. A. Ionescu 807
Characteristic of the Copper Arc During the Formative Period. P. L. Betz and S. Karrer 808
Investigation of Electric Arc in Gravity-Free Space. M. Steenbeck 809
Ionisation and Conductivity in Gases at High Pressures. J. Clay 1266
Sparking Potential of Mercury Vapour. F. L. Jones and W. R. Galloway 1267
Recombination of Ions in Pure Oxygen as a Function of Pressure and Temperature. M. E. Gardner 1700
Spectrum of Mobilities of Large Ions. Ouang Te-Tchao 1701
Force on Kathode of a Copper Arc. R. M. Robertson 2111
Transport of Ions in Gas at Supersonic Velocity. V. Volkovisky 2542
Development of Spark Discharge. T. E. Allibone and J. M. Meek 2544
γ-Ray Ionisation Currents in Air at High Pressures and High Gradients. J. W. Broxon and G. T. Merideth 3202
Analysis of High Gradient, High Pressure, γ-Ray, Air Ion Current Measurements, by Zanstra's Adaptation of Jaffé's Columnar Theory. J. W. Broxon and G. T. Merideth 3203
Nature of Oscillating Spark Discharge. I. Purcaru 3342
Point to Plane Discharge in Air. A. F. Kip 4191
Application of Clay's New Value of the Jaffé-Zanstra Coefficient for Air to High Pressure Ion Current Measurements. J. W. Broxon and G. T. Merideth 4895
Rate of Vaporisation of Mercury from an Anchored Kathode Spot. L. Tonks 5023

3. Low-Pressure Discharge. Dark Space. Kathode Fall of Potential. Negative Glow. Positive Column. Electrodeless Discharge.

Discharge of a Condenser across a Tube of Gas. J. Bethenod 289
Kathode Region in the Glow Discharge. A. K. Brewer and J. W. Westhaver 290
Behaviour of an Osglim Lamp. Part III. L. F. Richardson 291
Effect of Current Density on Ionisation Phenomena in Self-Maintained Discharges in Rare Gases. R. Schade 810
Characteristics of Probe Electrodes in a Contracted Discharge. S. Gvosdover 811
Electric Discharges in Neon. H. J. Lindenhovius 812
Examination of Electron Surge in the Expansion Chamber. H. Raether 813
Charge of Slow Ions with Positive Resonance Energy Defect. F. Wolf 814
Interpretation of Tube Counter Data. J. Meixner 815
Super-Temperature in the Dark Space of the Glow Discharge. A. Güntherschulze and W. Bär 816
Liberation of Electrons by Positive Ions Rebounding from an MgO Kathode in the Anomalous Glow Discharge. A. Güntherschulze and W. Bär 817
Charge Exchanges of H and He Canal Rays in Gases in the Velocity Range 30 to 200 ekV. H. Meyer 818
Variation in Sparking Potential in Irradiated Electrodeless Discharge Tubes. R. Zouckermann 1268
Field Strength of Positive Column of Low Pressure Discharges in Gas Mixtures. H. Alterthum and A. Lompe 1269
Influence of Magnetic Field on the Potential Gradient in Plasma. E. Reichrudel and G. Spivak 1702
Negative Ions in Discharge Tubes. K. G. Emeleus and J. Sayers 2112
Ion Layer around a Probe in a Low Pressure Discharge. V. Polin and S. Gvosdover 2113
Theory of Probes in Gases at High Pressures. F. Borgnis 2114
Effect of Variations of Probe Conditions on the Langmuir Probe Characteristic. W. P. J. van Berkel 2115
Emission of Radiation in the Positive Column of a Mercury Arc. B. T. Barnes and E. Q. Adams 2116
Mechanism of Positive Column in Mercury Vapour at Intermediate Pressures. E. Q. Adams and B. T. Barnes 2117

For the **Key** to this Index see pp. 1182 to 1194.

Conduction (Electric) and Discharge in Gases, *continued.*

Abstract Nos.

Positive Column Characteristic of the Low-Pressure Discharge and its Significance as Regards Individual Discharge Processes. R. Rompe and M. Schön 2118
Resistance of Vacuum Sparks. V. H. Sanner 2119
Discharges in the Rare Gases. R. Schade 2120
Self-Sputtering of the Kathode in Glow Discharge. H. Fischer 2121
Quantitative Measurements of Intense Condenser Discharges in Hydrogen at Reduced Pressure. E. Blum 2545
Breakdown in Vacuum Tubes at High Voltages. N. Neuert 2546
Operation of Tube Counters. O. Zeiller 2838
Simple Relation in the Glow Discharge. Y. Kasiwagi 2967
Effect of Positive Ion Bombardment on the Emission of Electrons from the Kathode in the Glow Discharge. Part II. A. Güntherschulze and H. Betz 2968
Effect of Positive Ion Bombardment on the Electron Current from the Kathode in the Glow Discharge. Part III. A. Güntherschulze and W. Bär 2969
Potential Gradient in Positive Column. S. Gvosdover 2970
Kathode Sputtering. U. K. Bose 3343
Dynamic Characteristics of Glow Discharge Tubes. H. J. Reich and W. A. Depp 3344
Regularities of Anode Glow in Relation to those of the Layered Positive Column in Hydrogen and Nitrogen. A. Güntherschulze, W. Bär and H. Betz 3345
Explanation of Action of Hollow Kathodes. A. Lompe 3346
Effect of Positive Ions on the Mobility of the Electrons in the Hg Arc. W. Elenbaas 3347
Instability of the Smallest Self-Maintained Gas Discharge; Applications to the Geiger Counter. C. van Geel and J. Kerkum 3348
Characteristics of a Strong Ion Source. G. Timoshenko 3349
Explosion Potential in Benzene. E. Badareu and L. Constantinesco 3798
Rôle of Tube Walls, and Surface and Space Charges in Electrical Discharges through Rarefied Gases. J. Zeleny 3799
Gas Temperature and Population of Atomic Levels in a Carbon Arc at Low Pressure. R. C. Mason 3800
Effect of Longitudinal Magnetic Field on Conductivity and Refractive Index of Ionised Air. B. N. Singh 3875
Explosive Potential in Benzene. E. Badereu 4192
Townsend Ionisation Factor γ. R. Schöfer 4193
Striated Positive Column. Part I. Pure Hydrogen. A. Güntherschulze and H. Meinhardt 4194
Influence of Tube Diameter on Concentration of Excited States in the Positive Column. W. Dirbach and K. Krebs 4195
Influence of the Ramsauer Effect on the Potential Gradient in a Positive Column. B. Klarfeld 4196
Characteristics of Glow to Arc Transition in Mercury Vapour. F. A. Maxfield and G. L. Fredendall 4197
Luminous Appearances and Sinusoidal Electric Oscillations of the Flash Discharge. R. Ricamo 4623
Glow Discharge Relation. Y. Kasiwagi 4624
Excess Temperatures in the Glow Discharge. H. Fischer 4625
Background Effect in Tube Counters. H. Osterwisch 4896
Counting Losses in Geiger-Müller Counter Circuits and Recorders. H. Lifschutz and O. S. Duffendack 4897
Ionising Radiation Accompanying a Spark Discharge. H. Raether 5024

4. Ionisation by Electron Impact. Critical Potentials.

Multiple Ionisation of Inner Electron Shells of Atoms. F. K. Richtmyer 241
Excitation Potentials of the N_2 Levels $B^3\Pi$ and $C^3\Pi$. R. Bernard 292
Light Excitation by Hydrogen and Deuterium Canal Rays. R. Junkelmann 689
Potential Energy Curve of the Excited State of LiH. E. J. Rosenbaum 720
Optical Excitation of Gases by Canal Rays of Hydrogen and Deuterium. W. Hanle 819
Probability of a Stepwise Excitation of Mercury Atoms. V. Fabrikant and I. Cirg 820
Formation of Mercury Molecules. Part II. F. L. Arnot and M. B. M'Ewen 910

For the **Key** to this Index see pp. 1182 to 1194.

Conduction (Electric) and Discharge in Gases, *continued.*

Abstract Nos.

Excitation of Gases at Very Small Gas Pressures by Electron Collision. W. v. Meyeren 1270
Probability of Collisions of the Second Kind between Atoms and Free Electrons. V. Fabrikant 1307
Excitation of Gases. Part II. W. Hanle 1703
Excitation of Atomic Jets by Electronic Bombardment. R. Planiol 1704
Cumulative Excitation of Atoms in a Low Pressure Mercury Discharge. W. Fabrikant, F. Butajewa and I. Zirg 2122
Dissociation of Ethane by Electron Impact. J. A. Hipple, Jr. 2124
Critical Potential of CO. J. Savard and M. de Hemptinne 2547
Formation of Helium Molecules. F. L. Arnot and M. B. M'Ewen 2656
Experimental Study of Electron Affinity. L. Goldstein 2971
Formation and Excitation of Molecular Ions in Active Nitrogen. U. Stille 3671
Critical Potentials of CO. J. Savard 3801
Influence of Radiation on Ionisation Equilibrium. B. N. Srivastava 3961
Excitation of Metastable Atoms in a Gas Discharge. V. Fabrikant 4198
Relativity Corrections for the Ionisation Potential of Atoms with Two Electrons. H. A. S. Eriksson 4200
Electron Temperature and Light Excitation in Gas Discharge Excited by Short and Ultra-Short Waves. W. Nöller 4517
Initial Recombination of Ions. L. Onsager 5025

5. Ionisation by Collision with Atoms and Ions.

Effect of Metastable Atoms on the Current in a Non-Self-Sustaining Ne Discharge. I. I. Glotov 293
Ionisation Coefficients in Pure Ne and Ne-A Mixtures. I. I. Glotov 294
Large Angle Scattering and Energy Loss of Potassium Ions Scattered by Heavy Monatomic Gases. A. G. Rouse 821
Effect of Kathode Material on the Second Townsend Coefficient for Ionisation by Collision. W. E. Bowls 1705
Coefficient of Volume Ionisation for Pure Neon and Neon-Argon Mixtures. I. I. Glotov 2123
Excitation of Light in Atomic Collisions between He or H and Alkaline Earths. K. Gailer 2481
Emission of Light by Low Velocity Particles. A. Kotecki 2482
Scattering and Dissociation of Slow Ions. F. Wolf 2548
Sensitivity of the Balanced Space-Charge Method for Detecting Ionisation of Gases by Collision of Ions and Atoms. A. Rostagni 2549
Sensitivity of Balanced Space-Charge Positive Ion Detector. R. N. Varney 2550
Experimental Contribution to the Question of the Validity of the Spin Conservation Law. K. Gailer 2972
Variation of Ionisation with Range of α-Particles, Protons, Deuterons and ^{3}H Particles. J. C. Bower 3644
Impulse Transference in Ionisation by Canal Rays. R. Koops 4626
Formation of Negative Ions at Metal Surfaces. R. A. Smith 4627
New Process of Negative-Ion Formation. Part IV. F. L. Arnot and C. Beckett 4628
Formation of Negative Ions by Positive-Ion Impact on Surfaces. R. H. Sloane and R. Press 4629

7. Positive Rays (Canal Rays). Anode Rays.

Mass-Spectrography and Nuclear Structure. J. Mattauch 3
Intensity Dissymmetry in the Emission of Light from Canal Rays. J. Stark and H. Verleger 203
Scattering of Helium Canal Rays by Helium Nuclei. C. Gerthsen 295
Magnetic Spectrograph Calculations. F. T. Rogers, Jr. 296
Lecture Apparatus for Artificial Disintegration using Canal Rays. R. Döpel 615
Light Excitation by Hydrogen and Deuterium Canal Rays. R. Junkelmann 689
Liberation of Electrons by Positive Ions Rebounding from an MgO Kathode in the Anomalous Glow Discharge. A. Güntherschulze and W. Bär 817
Charge Exchanges of H and He Canal Rays in Gases in the Velocity Range 30 to 200 ekV. H. Meyer 818
Optical Excitation of Gases by Canal Rays of Hydrogen and Deuterium. W. Hanle 819

Conduction (Electric) and Discharge in Gases, *continued.*

Abstract Nos.
Anode Rays of Heavy Metals. A. Poirot and M. Auclair ... 1271
Distribution of the Transverse Electric Field in Positive-Ray Analysis. E. Persico ... 1272
Bolometric Measurement of Ionic Rays. E. Leimberger ... 1706
Polarisation of Light Emitted from Canal Rays. H. Angenetter and H. Verleger ... 2461
Electron-Optical Theory of Precision Mass-Spectrographs. R. Herzog and V. Hauk ... 2551
Corpuscular Rays. Part II. A. Becker ... 2552
Discharge Phenomena and Ion Formation in Canal Rays. C. Hailer ... 2973
Mass-Spectrograph Examination of H_2 and He Canal Rays. W. Schütze ... 2974
Increase of Resolving Power of Mass-Spectrographs. R. Herzog and V. Hauk 3350
Axiality of Emission of Light from the Hydrogen Atom in an Electric Field. J. Stark, R. Ritschl and H. Verleger ... 3735
Light Emission and Ionisation of States of Motion of the Hydrogen Atom in Strong Electric Fields. J. Stark and R. Ritschl ... 3736
Slow Positive Rays. A. Rostagni ... 3802
Generation Conditions for Rapid Carriers with H.F. Multiple Acceleration. E. O. Schlosser ... 3803
Transverse Field for Postive and Neutral Rays. E. Persico and A. Rostagni 4201
Interference of Light from Canal Rays. H. Billing ... 4202
Action of a Proton Tube. T. Franzini ... 4232
General Theory of Double Focusing Mass-Spectrographs. R. Herzog and V. Hauk ... 5026
Effective Cross-Section of Positive Alkali Ions. K. H. Bracewell ... 5027

8. Chemical Effects of Discharge.

Chemical Effects of Electrical Discharge. K. R. Dixit ... 297
Duration of Life of Gaseous Ions and their Chemical Activity. P. Günther and L. Holzapfel ... 298
Effect of Atomic Hydrogen on Synthesis of Ammonia under Positive Ion Impact. A. Gelbart and I. Mochan ... 822
Formation of Ozone in an A.C. Low Pressure Discharge Tube. M. Senkus 1273
Chemical Effect of Electrical Discharge in Gaseous Hydrocarbons. Part IX. S. C. Lind and G. R. Schultze ... 2553
Recombination of OH Radicals in the Electric Discharge. V. Kondratjew ... 2554
Apparatus for the Purification of the Inert Gases and Hydrogen. W. Weizel 2556
Chemical Activity of Gas Ions: Decomposition of Azomethane under the Influence of X-Rays. P. Günther and H. Theobald ... 2920
Chemical Actions of Hydrogen Excited by Electrodeless Discharge. H. Nagaoka and T. Mishima ... 3351
Dissociation of O_2 and Formation of O_3 in the Silent Electric Discharge. R. Krishnan and S. K. K. Jatkar ... 4630

10. Unclassified.

Ionisation Produced by the Evaporation of Water. E. Medi ... 129
Atomic Hydrogen. H. G. Poole ... 300
Search for Ionisation of Hydrogen by Diffusion through Palladium. R. G. Stansfield ... 442
State of Equilibrium between Large and Small Ions in a Gas. Ouang Te-Tchao and A. Langevin ... 823
Statistical Measurement of Electron Rays. K. H. Stehberger ... 872
Transport of Ions by Current of Gas. Expansion of Gas when Ionised. M. Moreau-Hanot ... 2543
Electrophysics of Gases. Part II. G. Mierdel and R. Seeliger ... 2557
Nature of Ionic Preference in Wilson Cloud Chamber Condensation Experiments. L. B. Loeb, A. F. Kip and A. W. Einarsson ... 2951
Transport of Ions by Current of Vapour to Obtain High Voltage. J. Virgitti 2795
Gas Current H.V. Generators. M. Pauthenier ... 4203
Carrier Mobility Spectra of Liquids Electrified by Bubbling and Spraying. S. Chapman ... 4827
Production of Condensation Nuclei in the Presence of Electrical Charges. G. Tohmfor and M. Volmer ... 5003

Conduction (Electric) and Discharge in Gases, *continued.*

Abstract Nos.

Sputtering of Oxide-Covered Mg Surfaces. R. W. Ditchburn and K. I. Roulston 5028

Formation of Electrical Discharge in Gases. E. Flegler 54B
D.C. Corona in Coaxial Cylindrical Fields. H. Prinz 55B
Pressure Due to Corona in a Closed Space. A. Gemant 56B
Electric Spark as a Source of Photo-Ionisation. A. Wallraff and E. Horst 353B
Building-up Period in Spark Delay. R. Strigel 724B
Statistics of Spark Delay in Air at Atmospheric Pressure. R. Strigel 725B
Sparking and Sparking-Potential Variations. W. Rogowski and A. Wallraff 726B
Breakdown of Compressed Nitrogen in Small Gaps. I. M. Goldman 1153B
Corrosion of Metal by Corona. A. Güntherschultze and H. Betz 1489B
Corona Discharge from a Point. R. Uenisi 1496B
Influence of Admixture on B.D.V. in Argon. S. K. Moralew 1497B
Energy Transfer in Positive Column of the Rare Gases. G. Mierdel 2114B
Radiation Impulse from a Spark. M. Toepler 2602B
Electrical Phenomena in the Positive Column at Low Pressure. W. Uyterhoeven 2603B
Emission of Light in the Positive Column at Low Pressure. W. Uyterhoeven 2878B
Arc Discharge in Magnetic Field. S. Fukuda and S. Hoh 3171B
A.C. Spark between Large Electrodes. Y. Ishiguro and V. Gosho 3172B
Glow Voltage Curves for Noble Gases. H. Klemperer 3174B

Conduction (Electric) in Solids and Liquids.

1. Theories.
2. Voltage Measurement.
3. Current Measurement.
4. Resistance Measurement.
5. Current and Voltage Stabilisation and Amplification.
6. A.C. Resistance. Skin Effect.
7. Effects of Temperature, Pressure and Mechanical Stress on Resistivity.
8. Surface Conduction. Contact Resistance (including Contact Rectifiers).
9. Special Effects (Supraconductivity, etc.)
10. Conductivity:
    (*a*) Metals, Alloys and Non-Metals.
    (*b*) Liquids (including Solutions).
    (*c*) Dielectrics.
11. Apparatus, *see* Supplementary Index.
12. Unclassified.

Cross-References :
Effect of Magnetic Field on Resistance, *see* Galvanomagnetic and Thermomagnetic Effects.
Heating Effect of Current, *see* Thermoelectricity.
Photoconductivity, *see* Photoelectricity.
Rectifiers (other than Contact) and Rectification, *see* Oscillations, Electric.
Units of Measurement, *see* Mathematical Methods, etc.

1. Theories.

Theory of Motion of Electrons in Gases and Semiconductors. B. Davydov 287
Electron Energy Bands in Copper and Silver. S. R. Tibbs 927
Electron Theory of the Conductivity of Thin Metallic Films. K. Fuchs 1276
Electron Conduction and Photochemical Reactions in Alkali Halide Crystals. R. W. Pohl 1277
Conduction in Polar Crystals. Part I. N. F. Mott and M. J. Littleton. Part II. N. F. Mott. Part III. R. W. Gurney and N. F. Mott 1708
Interaction between Closed Circuits Carrying Steady Currents. M. Wolfke 2125
Approximate Treatment of Electrons in a Crystal Lattice. O. Klein 2126
Electronic States of Divalent Metals. K. Ariyama 2127
Conduction by Convection and Diffusion in Cylindrical Arrangements. F. Borgnis 2558
Electronic Structure of Alloys. T. Muto 2669
Improved Calculation of the Energies of Metallic Li and Na. J. Bardeen 3068
Compressibilities of Alkali Metals. J. Bardeen 3069
Thermal Conductivity of Metals. R. E. B. Makinson 3759
Effects of Electron Interaction on Energy Levels of Electrons in Metals. E. Wigner 3804
Energy Levels in Real and Ideal Crystals. N. F. Mott 3904
Excited Energy Levels of Insulating Crystals. J. C. Slater 3905
Electronic Structure of Metals. J. Farineau 3906
Resistance of a Metal at Low Temperatures and Matthiessen's Rule. G. P. Dube 5029

Conduction (Electric) in Solids and Liquids, *continued.*

2. Voltage Measurement.

Abstract Nos.
Zero-Shunt Valve A.C. Potentiometer. J. J. Dowling 805
Two-Valve Voltmeter. W. C. Michels 824
Electronic Voltmeter with Logarithmic Scale. M. Nuovo 1278
Inverse Valve Voltmeter. O. H. Schmitt 2128
Improved Circuit for the D.C. Amplifying Valve of a Valve Voltmeter. R. E. Burgess 2559
Measurement of R.F. Voltage in a Cyclotron. W. E. Danforth and M. B. Sampson 3352
Potentiometric Measurement of Extremely Small Voltages. I. Amdur and H. Pearlman 3353
Thermionic Voltmeter with a Linear Law. D. G. Reid 3805
Push-Pull-Stabilised Triode Voltmeter. C. Williamson and J. Nagy 4631
Null Method for Measuring E.M.F. with a Ballistic Galvanometer and Condensers. A. W. Smith 4632
Stability of Zero of Valve Electrometer Circuit. F. Müller and W. Dürichen 5030

3. Current Measurement.

Measurement of Current at Radio Frequencies. T. I. Jones 1279
Ballistic Galvanometers in Closed Circuits. J. Gilbert 1339
Anomalous Charge and Discharge Currents in Dielectrics. E. Hippauf and R. Stein.................... 1722
Absolute A.C. Measurements and Calibration of Thermocouples up to 500 Mc./sec. M. J. O. Strutt and K. S. Knol 2129
Corrections for Winding Space of Coils of Rayleigh Current Balance. H. v. Steinwehr and W. Gremmer 2976
Electrical Control of Galvanometer Characteristics. O. H. Schmitt 3354
Photoelectric Contact-Making Galvanometer. W. L. Carson 3878
Characteristic Constants of the Moving-Coil Galvanometer and their Determination from the Periodic Proper Motion. L. Merz 4633

4. Resistance Measurement.

Absolute Measurement of Resistance. L. Hartshorn and N. F. Astbury 1280
Electrical Resistance of Selenium at High Field Strengths. F. P. Henninger 2130
Bridge Potentiometer for Comparing Electric Resistance Standards. M. Romanowski and M. Picard 2131
Ratio of International Ohm to Absolute Ohm. R. Jouaust, M. Picard and R. Herou 3355
Simple Bridge for Comparison of Low Resistance Standards. D. C. Gall 3356
Determination of Absolute Ohm, Using an Improved Self Conductor. H. L. Curtis, C. Moon and C. M. Sparks 5031

5. Current and Voltage Stabilisation and Amplification.

Valve Circuit for Scaling Down Counting Rates. E. C. Stevenson and I. A. Getting 299
Regulator Systems for Electromagnets. H. L. Anderson, J. R. Dunning and D. P. Mitchell 887
Valve Amplifier for Weak Currents. F. Bedeau and L. Herman 2132
Differential Amplifier. J. F. Toennies 2133
D.C. Mains Voltage Stabiliser. R. J. Hercock 2134
Stabiliser with only Two Valves for Each Stage. K. E. Forsman 2977
Automatic Regulation of Current in Shearer X-Ray Tube. H. le Caine...... 3286
Direct-Voltage Amplifier. E. L. E. Wheatcroft 4634
Dual-Range Potential Source for Field Use with Electroscopes and Geiger-Müller Counters. W. C. Bosch 4635
Amplification of Thermo-E.M.Fs. R. Gunn 4733
Counter Circuit for D.C. Mains. C. B. Madsen 4898
Differential Amplifier for Electrophysiology and for Bridge Measurements. H. König 5067

6. A.C. Resistance. Skin Effect.

H.F. Resistance of Cylindrical Conductors. E. P. Adams 825

For the **Key** to this Index see pp. 1182 to 1194.

Conduction (Electric) in Solids and Liquids, *continued.*

7. Effects of Temperature, Pressure and Mechanical Stress on Resistivity.

Abstract Nos.

Influence of Pressure on the Curie Point of Ni-Cu Alloy. A. Michels, A. Jaspers, J. de Boer and J. Strijland 356
Effect of Tension on Electrical Resistance of Single Tetragonal Tin Crystals. M. Allen 826
Effect of Cold Working and Heat Treatment on the Electric and Magnetic Properties of Pure Nickel Part I. Drawn Nickel Wire. H. Bittel 1709
Resistance of Metals under Pressure. P. W. Bridgman 2135
Electrical Resistance of Gold Below 1° K. W. J. de Haas, H. B. G. Casimir and G. J. van den Berg 2136
Resistance Material " Isabellin." A. Schulze 2978
Specific Resistance and Temperature Variation of Resistance of Tin Crystals. B. Chalmers and R. H. Humphry 2979
Effect of Cold Working and Heat Treatment on the Electric and Magnetic Properties of Pure Nickel. Part II. Twisted and Stretched Nickel. H. Bittel 4204

8. Surface Conduction. Contact Resistance (including Contact Rectifiers).

H.F. A.C. Electroosmosis between Plane Parallel Walls. L. Rosenhead and J. C. P. Miller 24
Electrical Conductivity of Copper Oxide. L. Dubar 1281
Surface Conductivity of Ceresin-Coated Quartz. C. H. Hou 1710
Contact Capacity between Metals and Semiconductors. G. Dechêne 2137
Rectifying Action of Semiconductors. B. Davydov 2560
Semiconductor in an Alternating Current. G. Dechêne 3357
System Cu-Cu_2O-Cu. E. Wehner 3358
Conductivity and Oxygen Excess in Cuprous Oxide. C. Wagner and H. Hammen 3359
Unipolar Conductivity of Carborundum. J. K. Bose and S. R. Khastgir 3806
Cu_2O Rectifiers. H. Nöldge 3807
Streaming Potentials and Surface Conductivity. A. J. Rutgers, E. Verlende and M. Moorkens 4636

9. Special Effects (Supraconductivity, etc.).

New Conception of Supraconductivity. F. London 302
Magnetic Behaviour of Current-Carrying Supraconductors on Transition to Supraconducting State. K. Steiner 303
Magnetic Induction and Supraconductivity. J. Stark, K. Steiner and H. Schoeneck 304
Electrical Conductivity of Tungsten Single Crystals at Low Temperatures in Strong Magnetic Fields. E. Justi and H. Scheffers 305
Relation of London's Equations to the Acceleration Theory of Supraconductivity. F. Bopp 1282
Magnetic Energy of Supraconductors. P. S. Epstein 1283
Experiments at Radio Frequencies on Supraconductors. F. B. Silsbee, F. G. Brickwedde and R. B. Scott 1284
Thermo-E.M.Fs. of Supraconductors Near Their Transition Points. W. H. Keesom and C. J. Matthijs 1366
Atomic Heats of Supraconducting and Non-Supraconducting Tin. W. H. Keesom and P. H. van Laer 1671
Influence of Magnetic Fields on Persistent Currents in Supraconductors. K. C. Mann and J. O. Wilhelm 1711
Resistance of a Supraconductor in the Intermediate State. H. G. Smith 1712
Current Distribution in Supraconductors. M. v. Laue 1713
Equilibrium of Supraconductors. N. Felici 1714
Indeterminacy of the Electromagnetic Potentials. B. Kwal 1741
Growth of Nuclei of Magnetisation at Large Barkhausen Discontinuities. W. Döring 1744
Theory of Supraconductivity. F. London 2138
Motion of Supraconductors. N. Felici 2139
Resistance of Supraconducting Cylinders in a Transverse Magnetic Field. A. D. Misener 2561
Equilibrium of Supraconductors. N. Felici 2980

Conduction (Electric) in Solids and Liquids, *continued.*

Abstract Nos.

Thermodynamics of Supraconduction. M. v. Laue 2981
Magnetic Threshold Values for Supraconductivity. M. v. Laue 2982
Magnetic Properties of Small Metallic Specimens at Low Temperatures. F. Hund 3020
Thermo-E.M.F. of a Supraconductor against the Same Metal in the Non-Supraconductive State. W. H. Keesom and C. J. Matthijs 3040
"Overshoot Phenomenon" in Supraconductivity. A. D. Misener 3808
Gyromagnetic Effect in Supraconductors. I. K. Kikoin and S. V. Goobar 3860
Phenomena at the Temperature of Liquid Helium. E. F. Burton 4168
Coexistence of Normal and Supraconductive Regions. K. Mendelssohn and J. G. Daunt 4205
Conductivity of Lead Crystals at Low Temperatures in Strong Transverse Magnetic Fields. E. Justi and H. Scheffers 4233
Intensity of Orbital Interaction in Transition Elements. R. Forrer 4984
Influence of Magnetic Fields on Persistent Currents in a Closed Supraconducting Circuit. K. C. Mann, H. G. Smith and J. O. Wilhelm 5032
Relaxation Effects Connected with the Transition Between the Supraconducting and Normal States. H. G. Smith and K. C. Mann 5033

10. Conductivity.

(*a*) *Metals, Alloys and Non-Metals.*

Specific Resistances of Platinum Wires and Mean Free Paths of Conduction Electrons. H. Reuter. 306
Resistance and Magnetic Susceptibility of D_2-Charged Palladium. A. Sieverts and W. Danz. 307
Conductivity and Diffusion in the Semi-Metallic Alloys $Cu_{2-x}Se$. H. Reinhold, H. Möhring and H. Seidel 308
Mechanism of Ionic Conduction in Solid Salts. E. Koch and C. Wagner 1285
Ionic Conduction in Thin Layers of NaCl. J. Boros 1286
Wiedemann-Franz Law in Crystals. M. Kohler 1287
Electrical Behaviour of Thin Metallic Films Condensed at Low Temperatures. H. R. Mitchell. 1288
Allotropy of Neodymium. F. M. Jaeger, J. A. Bottema and E. Rosenbohm 1380
Transformation Temperature of a Metallic Film. Part II. T. Fukuroi 1865
E.H.F. Electrical Constants of Soil. M. K. Chakravarty and S. R. Khastgir 2355
Thermal and Electrical Resistance of a Tungsten Single-Crystal at Low Temperatures and in Magnetic Fields. W. J. de Haas and J. de Nobel 2501
Electrical Properties of Manganese Ferrites. A. Schulze and W. Gremmer 2562
Electrical and Thermal Investigation on Manganin. Part II. A. Schulze .. 2563
Electrical Properties of Metal Films. E. Perucca. 2564
Electrical Conductivity of Thin Metallic Films. Part III. Alkali Films with Properties of Normal Metal. A. C. B. Lovell 2565
Atomic Rearrangement Process in the Copper-Gold Alloy Cu_3Au. Part II. F. W. Jones and C. Sykes 2672
Dielectric Constant and Conductivity of Soil at High Radio Frequencies. S. S. Banerjee and R. D. Joshi 2792
Optical Constants, Electrical Resistance and Structure of Thin Metal Films. J. Krautkrämer 3468
Electrical Conductivity and Phase Diagram of Ni-Mo Alloys. G. Grube and H. Schlecht 3809
Electrolytic Conduction in Solids and Crystal Structure. J. A. A. Ketelaar .. 3810
Conductivity of Transition Metals. A. H. Wilson 4206
Properties of Thin Sheets of Noble Metals in Contact with Gases. M. Auwärter and K. Ruthardt 4369
Electronic Conduction due to 4*f*-Electrons in Trivalent Rare-Earth Compounds. K. Ghosh and B. Ghosh 4637
Atomic Resistance Increase of Dilute Lead Alloys between 273° and 14°K. A. Eucken and H. Schürenberg. 4638
Electrical Conductivity and Phase Diagram of Ba Alloys with Bi, Mg, and Pb. G. Grube and A. Dietrich 4639

(*b*) *Liquids* (*including Solutions*).

Conductances of Standard KCl Solution. R. W. Brenner and T. G. Thompson 309
Conductance of Salts in H_2O-D_2O Mixtures. J. P. Chittum and V. K. La Mer 310
Conductivities of Metallic Complexes in Dilute Solution. A. B. Densham .. 311
H.F. Conductivity of Colloidal Electrolytes. G. Schmid and T. R. Aalts 312

Conduction (Electric) in Solids and Liquids, *continued.*

Abstract Nos.

Configuration of Carbohydrates by Conductivity Measurements in Boric Acid Solution. H. T. Macpherson and E. G. V. Percival 827
Electrical Conductivity of KCl in Methyl Alcohol-Water Mixtures. M. K. Thomas and D. C. Mandeville 1289
Dependence of Conductivity of Strong Electrolytes on Frequency and Field Strength. H. Falkenhagen and H. Fleischer 2566
Conductivity of Mixtures of Salts in Water. C. W. Davies 2567
D.C. Conductances of KCl Solutions. L. V. Andrews and W. E. Martin 2568
Computation of Ionisation Constants and Limiting Conductance Values from Conductivity Measurements. T. Shedlovsky 3360
Behaviour of Complex Ions in Strong Electric Fields. H. Diekmann 3361
Conductance of Aqueous Solutions of Electrolytes. D. A. MacInnes 3811
Limiting Conductivities of Organic Acids in Aqueous Solutions. J. F. J. Dippy 3812
Conductivity Anomalies in Molecular and Colloidal Disperse Solutions. K. Hoffmann 4288
Fluorescence, Absorption Spectra and Conductivity of Aqueous Solutions of Fluorescein, Rhodamine and Acriflavin. I. C. Ghosh and S. B. Sengupta 4549
Conductivity Data of Aqueous Mixtures of H_2O_2 and HNO_3. W. H. Hatcher and D. W. MacLauchlan 4640
H.F. Conductivity of Colloidal Electrolytes. G. Schmid and E. C. Larsen .. 4641
Conductance of HCl in Dioxane-Water Mixtures. B. B. Owen and G. W. Waters 5034
Conductance of Mixtures of Lead Abietate and Tributyl-Ammonium Chloride in Toluene. V. Deitz and R. M. Fuoss 5035
Equivalent Circuit of Conductivity Cells. S. F. Acree, E. Bennett, G. H. Gray and H. Goldberg 5036

(*c*) *Dielectrics.*

Electrical and Optical Properties of Oxides of Cd, Tl and Sn. G. Bauer 836
Relation between the Energy Constant (ε) and the Quantity Constant (α) in the Conductivity-Temperature Formula of Oxide Semiconductors. W. Meyer and H. Neldel 837
Resistance of Cu_2O in Fields of High Strength. F. P. Henninger 2569
Resistance and Capacity of Monofilms of Barium Stearate. C. E. Buchwald, D. M. Gallagher, C. P. Haskins, E. M. Thatcher and P. A. Zahl 2742
Photoelectric Current Limiting Device for Insulation Measurements. E. B. Baker and H. A. Boltz 3362
Electrical Volume Resistivity of Insulating Glasses. E. Seddon 3363
Solid Dielectrics in the Alternating Field. F. Borgnis 3364
Dielectric After-Effects in Solid Non-Conductors. G. M. Voglis 3365
Laws of Conduction in Semiconductors. F. Möglich 3813
Electrical Conductivity and Thermoelectric Characteristic of Semiconductors. B. M. Hochberg and M. S. Sominski 3814
Conductivity and Dielectric Constants of Crystals. M. G. Rahimi 4207
Passage of Electrons through Thin Films of Insulators. H. Klarmann and J. Múhlenpfordt 4642
Electrical Conduction in Quartz, Periclase, and Corundum at Low Field Strength. E. G. Rochow 4643
Anomalous Charging Current in Rochelle-Salt Crystals. F. Seidl 5081

12. Unclassified.

Conductivity Measurements for Control and Regulation of Processes. O. Dobenecker 828
Electric Currents and Counter E.M.F.'s in Paraffin Wax in the Natural State and Subjected to γ-Radiation. W. Ścisłowski 2983
Physical Basis of Some Metallurgical Problems. W. Gerlach 3404

H.F. Electrodynamic Ammeter. H. M. Turner and P. C. Michel 66B
Oil-Immersed Generating Voltmeter. H. A. Thomas 71B
New H.F. Ammeter. H. Straubel 366B
Resistance Amplifier Voltmeter with Constant Relative Sensitivity. G. A. Beauvais 367B
Transient Maximum and Minimum Voltages by Thyratron Potentiometer. A. Hickling and J. H. Bruce 369B
Measurement of High Resistance with a Thyratron. J. L. Eck 371B
Theory of the Johnson Effect, Especially at Supraconductivity. H. Baerwald 410B

Conduction (Electric) in Solids and Liquids, *continued.*

Abstract Nos.

Siemens Moisture-Content Meter for Wood. P. M. Pflier 731B
Measurement of Minute Alternating Currents. S. R. Khastgir 1168B
Measurement of D.C. Potentials in Circuits of High Resistance. R. H. Cherry 1169B
D.C. Amplifier for Photo-Cells. R. W. Gilbert 1354B
Method of Stabilising Anode Currents. R. Pinoir 1408B
A.C. Electrometer. H. B. Brooks, F. M. Defandorf and F. B. Silsbee 1522B
H.V. Measurements by Transformer Method. F. B. Silsbee and F. M. Defandorf 1523B
Conductivity. G. A. Percival 1526B
Wheatstone-Bridge Deflection Method. K. Melzer 1535B
Sharp Cut-off in Valves, with Application to Slide-Back Voltmeter. C. B. Aiken and L. C. Birdsall 1833B
Salt Content by Conductivity Measurement. W. Schuh 1837B
Resistance Measurement with Parallel Wires. H. Brückmann 1840B
Measurement of the Specific Resistance of Liquids. A. Claassen 2626B
New Reflecting Galvanometer. K. W. Kögler 3392B
Measurement of Small D.C. Potentials. L. Merz 3399B

Conduction (Thermal).

1. Theory.
2. Conductivity Coefficients:
   (*a*) Gases.
   (*b*) Liquids.
   (*c*) Solids.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

1. Theory.

Influence of Magnetic Fields on the Heat Conductivity of Gases. Part IV. H. Senftleben and J. Pietzner 244
Accommodation Coefficients of Noble Gases and Specific Heat of Tungsten. W. C. Michels 245
Suggested Explanation of Properties of Liquid He II. A. Michels, A. Bijl and J. de Boer 1235
Theory of Heat Conduction. W. Kroll 1673
Heat Flow in Laminated Materials. R. Størmer 2065
Partition of Heat Flow in Double Wall Methods. P. Vernotte 2066
New Solution of Heat Flow Problems. P. Vernotte 2067
H. F. Longitudinal Waves in Viscous Fluids. R. Lucas 2090
Calculation of Heating of Conductors by Current or by Radiation. J. Fischer 2202
Thermal Conductivity of Gases. P. Guareschi 2499
Application of Fourier Analysis to Heat Flow in Complex Systems. P. Vernotte 2927
Temperature Distributions of Linear Conductors Heated by Current or by Radiation. J. Fischer 3042
Thermal Agitation in the Presence of a Gravitational Field. E. Sevin 3151
Distribution of Frictional Heat between Two Bodies. F. Charron 3296
Flux Distribution of Heat Generated Between Two Media in Poor Contact. P. Vernotte 3758
Thermal Conductivity of Metals. R. E. B. Makinson 3759
Energy Exchanges at Boundary Surfaces. H. J. de Boer 3760
Heat Conduction in a Medium Having Thermal Properties Depending on the Temperature. M. R. Hopkins 3761
Theory of Heat Conduction. H. S. Carslaw and J. C. Jaeger 4577

2. Conductivity Coefficients.

(*a*) *Gases.*

Effect of Magnetic Field on Viscosity of Gases. H. Senftleben and H. Gladisch 502
Effect of Temperature on Thermal Conductivity and Accommodation Coefficient of Hydrogen. H. Spencer-Gregory and E. H. Dock 1236
Manipulation of the Farkas Microthermal Conductivity Analysis Apparatus. H. F. Walton 1373
Effect of Magnetic Fields on the Thermal Conductivity of Gases. E. Rieger .. 2068
Thermal Conduction in H_2-D_2 Mixtures. C. T. Archer 2069
Thermal Conductivity of Gaseous Hydrocarbons and Atomic Polarisation. R. Delaplace 3297
Duration of Energy Interchange between Gas-Molecules and a Solid Surface W. Hunsmann 4353

For the **Key** to this Index see pp. 1182 to 1194.

Conduction (Thermal), *continued.*

Abstract Nos.

Molecular Theory of Gases. Part II. M. Trautz 4994

(*b*) *Liquids.*

Thermal Conductivity of Liquid Helium II. W. H. Keesom, A. P. Keesom and B. F. Saris 2070

Thermal Expansion and Conductivity in Liquid Helium II. H. Jones 2503

Low-Temperature Researches. J. D. Cockcroft 2934

Thermal Conductivities of Hg, Na, and Na-Amalgams in the Liquid State. W. C. Hall 3298

Thermal Conductivity of Liquids. O. K. Bates, G. Hazzard and G. Palmer 3299

Thermal Conductivities of Liquid O_2 and N_2. G. Hammann 4165

Free Volumes and Free Angle Ratios of Molecules in Liquids. J. F. Kincaid and H. Eyring 4330

(*c*) *Solids.*

Temperature Variation of Thermal Conductivity and X-Ray Structure of Micas. Part I. Thermal Conductivity up to 600°C. R. W. Powell and E. Griffiths. Part II. X-Ray Examination of Structure. W. A. Wood 246

Heat Conduction of Foil-Covered Insulation. I. S. Cammerer 759

Thermal Conductivity of Diamond and Potassium Chloride. W. J. de Haas and T. Biermasz 760

Thermoelectric Power, Thomson Coefficient and Thermal Conductivity of Nickel. A. Hammer 1365

Thermal Conductivity of Crystals at Low Temperatures. W. J. de Haas and T. Biermasz 2071

Relative Thermal Conductivity of Metals. P. Vernotte 2500

Thermal and Electrical Resistance of a Tungsten Single-Crystal at Low Temperatures and in Magnetic Fields. W. J. de Haas and J. de Nobel 2501

Thermal Diffusivity of the Soil at Colombo Observatory. J. P. Andrews 2793

Thermal Conductivity of Fibreboard and Rock Wool. J. D. Babbitt 2928

Thermal Conductivity of Porcelain and Kieselguhr-Brick to 800°C. W. Koch 2929

Thermal Conductivity of Solidified Gases and Liquids. A. Eucken and H. Englert 3300

Conduction of Heat in Crystals. H. B. G. Casimir 3301

Dependence on Thickness of the Thermal Resistance of Crystals at Low Temperatures. W. J. de Haas and T. Biermasz 3762

Pressure Coefficient of Thermal Conductivity of Metals. C. Starr 3763

4. Unclassified.

Estimation of Deuterium. P. Harteck 794

Heat. R. W. Powell 1243

Heat Insulating Materials. E. Griffiths 2502

Thermal Equilibrium at Temperatures Below 1° Abs. E. S. Shire and J. F. Allen 2507

Influence of Transverse Magnetic Fields on Electrical and Thermal Conductivity of Pure Metals at Low Temperatures. E. Grüneisen and H. Adenstedt 2615

Effect of Transverse Magnetic Field on Thermal Resistance of Pure Metals. E. Grüneisen 2616

Heat Transfer to Boiling Liquids. E. T. Sauer, H. B. H. Cooper, G. A. Akin and W. H. McAdams 3118B

Convection.

1. Free Convection.
2. Forced Convection.
3. Emissivity and Rate of Cooling (including Loss of Heat by Radiation, Conduction and Convection).
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

1. Free Convection.

Instability in Fluid Layers when the Lower Surface is Heated. S. L. Malurkar 565

Limiting Form of Free Convection for Large Grasshof Numbers. D. A. Frank-Kameneckij 761

Radiation Stresses of Transverse Inertial and Viscous Waves in Liquids. R. Lucas 762

Instability of Fluids Heated from Below. K. Chandra 1237

Convection, *continued.*

Abstract Nos.

Transverse Bands in Layers of Air Heated from Below. D. Avsec 1238
Suggested Verification of Rayleigh's Criterion. P. Vernotte 1239
Motion of a Fluid Heated from Below. R. J. Schmidt and O. A. Saunders 2072
Non-Stationary Free Convection. D. A. Frank-Kameneckij 3764
Temperature Distribution in Reaction Vessel and Stationary Theory of Thermal Explosions. D. A. Frank-Kameneckij 3765

2. Forced Convection.

Extension of Nusselt Theory of Heat Interchange at Condensation. G. Krujilin 2522
Forced Convection with Laminar Flow. G. Ribaud 3302
Dispersion of a Turbulent Air Current and the Flow of Underground Water. K. Kitagawa 3935
Thermal Effects on Bodies in an Air Stream. W. F. Hilton 4578

3. Emissivity and Rate of Cooling (including Loss of Heat by Radiation, Conduction and Convection).

Calculation of Temperatures of Strongly Heated Rods and Wires. J. Fischer 4579

5. Unclassified.

Regulation of Heat Loss from the Human Body. J. D. Hardy and E. F. DuBois.. 763
Physical Laws of Heat Loss from the Human Body. J. D. Hardy 764
Heat. R. W. Powell 1243

Cosmogony.

Cosmic Radiation, *see* Emission (Radiation).

Nebular Counts and Hyperbolic Space. G. C. McVittie 98
Science and the Unobservable. H. Dingle 473
Kinematical Theory and the Distribution of Nebulae. G. C. McVittie 510
Fundamental Problems of Cosmogony and Newton's Law. G. Armellini 1016
Evolution of a Cosmical Dust-Cloud. K. Hillebrand 1017
Static Universe and Nebular Red Shift. Part II. S. Sambursky and M. Schiffer 1018
Apparent Luminosity of a Receding Nebula. H. P. Robertson 1028
Particular Dynamical Solution of the Cosmological Problem. F. F. Campolieti 1503
Expanding Universe. H. Shapley 1888
New Basis for Cosmology. P. A. M. Dirac 1889
Apparent Luminosity of Receding Nebulae. M. v. Laue 1892
Homogeneous Metrics in Cosmogonic Space. D. D. Kosambi 2319
Wave-Mechanics and Stellar Theory. H. Jehle 2320
Meaning of Uniform Time and the Kinematic Equivalence of the Extra-Galactic Nebulae. E. A. Milne and G. J. Whitrow 2321
Expansion of a Nebula. N. R. Sen 2323
Distances of Extra-Galactic Nebulae. G. C. McVittie 2325
Method of Determining Interstellar Coloration of Faint Stars. W. Becker 2347
Relativistic Statics in the Interior of a Liquid Mass. L. Venturelli 2750
Radiation Temperature of the Universe. W. Nernst 2751
Linear Equivalence. E. A. Milne and G. J. Whitrow 2752
Theory of Planets and White Dwarf Stars. A. Sommerfeld 2757
Interpretation of Terrestrial and Solar Magnetic Fields. J. Mariani 2815
Origin of Satellites. R. A. Lyttleton 3576
Origin of Binary Stars. R. A. Lyttleton 3577
Evolution of Eclipsing Binaries. Z. Kopal 3578
Empirical Cosmology. P. Jordan 3579
Electrodynamics and Cosmology. H. Mandel 3580
Spatial Distribution of Spiral Nebulae in Milne's Universe. W. Fricke 3581
Kinematical Theory, Curved Space and the Distribution of Nebulae. G. C. McVittie 3582
Dimensionless Constants of Physics. A. E. Haas 3956
Application of the Velocity-Distance Relation for Spiral Nebulae to Milne's Universe. W. Fricke 3988

Cosmogony, *continued.*

Abstract Nos.
Metagalactic Density-Gradient. H. Shapley 3993
New Systems of Normal Coordinates for Relativistic Optics. G. Temple 4350
Curvature of Space and the Limited Dimensions of the Stars. L. Laboccetta 4380
Eddington's Relation between Radius of Electron and Radius of Universe. L. Laboccetta 4381
Origin of Planets. J. H. Jeans 4382
Equation of Motion of a Particle in Wave Geometry. T. Iwatsuki, Y. Mimura and T. Sibata 4805
Cosmology in Terms of Wave Geometry. Part I. Y. Mimura and T. Iwatsuki 4806
Cosmology in Terms of Wave Geometry. Part II. T. Sibata 4807
Cosmology in Terms of Wave Geometry. Part III. H. Takeno 4808
Cosmology in Terms of Wave Geometry. Part IV. K. Itimaru 4809
Finslerian Wave Geometry and Milne's World Structure. T. Hosokawa 4810

Crystal Structure and Special Properties.

1. General Theory.
2. Crystal Structure:
   - (*a*) Metals and Alloys.
   - (*b*) Inorganic.
   - (*c*) Organic.
   - (*d*) Biological.
3. Liquid Crystals and Liquid Structure.
4. Morphology of Crystals (Crystal Form, Habit, Growth).
5. Special Properties.
6. Apparatus, *see* Supplementary Index.
7. Unclassified.

Cross-References:
Colloid Structure, *see* Colloids.
Surface Structure, *see* Surface Properties.

1. General Theory.

Derivation of the Number of Axes of Symmetry. H. Tertsch 28
Laue Diagrams. F. Laves 29
Calculation of Interplanar Spacings of Crystal Systems by Vectors. S. S. Sidhu 416
Method of Measuring the Internal Periodic Potential of Crystals. A. Hautot 417
Irrational Diffractions Obtained in Transmission of Fast Electrons Through Small Crystals. F. Kirchner and O. Rüdiger. M. v. Laue 418
Critical Ordering Temperature in Alloys. Part II. C. E. Easthope 419
Lattice Changes Associated with the Formation of Superlattices in Alloys. A. H. Wilson 420
Production of Large Single Crystals of KBr for Optical Use. D. C. Stockbarger 431
Theory of Twin Formation. Part II. I. Schaacke 433
Anomalous Vibrational Spectra. M. Blackman 719
X-Ray Scattering by Crystals with Variable Lamellar Structure. L. Landau 925
Evaluation of Hexagonal Structure Factors. C. A. Beevers and H. Lipson 926
Electron Energy Bands in Copper and Silver. S. R. Tibbs 927
Order and Disorder in Binary Solid Solutions. S. G. Kirkwood 928
Calculation of Constants of Sr and Ba. P. Gombás and G. Péter 1394
X-Ray Diffraction by Self-Illuminated Crystals. H. Ott 1395
Theory of Order for the Copper-Gold Alloy System. W. Shockley 1396
X-Ray Spectroscopic Data in Regard to the Electronic Energy Bands in KCl and NaCl. J. Valasek 1669
Conduction in Polar Crystals. Part I. N. F. Mott and M. J. Littleton. Part II. N. F. Mott. Part III. R. W. Gurney and N. F. Mott 1708
Forces Acting between Atoms and Ions and Physical Properties of Matter in Bulk. J. A. Wasastjerna 1786
Motion of Ethylene Halide Molecules in Crystals as Revealed by the Raman Effect. S. Mizushima and Y. Morino 2050
Formulæ for Calculation of the Velocity of Sound and of the Melting Point. R. Gianasso 2095
Approximate Treatment of Electrons in a Crystal Lattice. O. Klein 2126
Magnetic Properties and State of Ionisation of Atoms in Alloys. G. Foëx 2170
Lattice Energies of Alkali and the Electron Affinity of Iodine. A. N. Tandon 2233
Indexing of Stereographically Projected Crystal Faces. H. Tertsch 2234
Densest Position of Homologous Bodies. H. Hancock 2235
Order and Disorder in Alloys. H. A. Bethe 2236
Superlattice Formation of the Type AB in Alloys with Applications to the Theory of Adsorption. T. S. Chang 2237
Nuclear Formation in the Separation of Metallic Mixed Crystals. R. Becker 2238

Crystal Structure and Special Properties, *continued.*

Abstract Nos.
Theory of Crystal Deformation. A. Pistocchi 2255
Theory of Electron Diffraction and the Kikuchi Envelope. E. Lamla 2599
Computation of Three-Dimensional Fourier Syntheses in Crystal Structure Analysis. T. H. Goodwin and R. Hardy 2667
Inner Potentials of Graphite and Molybdenite. R. Uyeda 3001
X-Ray Surface Reflection Fields and their Application to Absorption Corrections and to Background Patterns. M. J. Buerger 3054
Interpretation of Laue Photographs. C. C. Murdock 3055
Ionic Spheres of Action. A. Pitschugin 3056
Dynamical Theory of the Space-Lattice Diffraction. Parts I and II. E. Fues 3335
Twinning and Coalescence in Lattices of Close Packed Spheres. G. Menzer 3457
Simplified Derivation of the Laue Particle Size Equation. B. E. Warren 3458
Diffraction of X-Rays by a Crystal. J. Laval 3459
Direct Determination of Crystal Structure from X-Ray Data. M. Avrami 3460
Energies of Disorder in Ionic Crystals. W. Jost 3461
Movement of Ions and Electrons in Solids and the Interpretation of Reactions between Solids. C. Wagner 3825
Energy Levels in Real and Ideal Crystals. N. F. Mott 3904
Excited Energy Levels of Insulating Crystals. J. C. Slater 3905
Electronic Structure of Metals. J. Farineau 3906
Atomic Vibrations in Mg. G. W. Brindley and P. Ridley 3907
Interaction of Atoms in Alloys. W. Shockley 3908
Energy States of Valency Electrons in Metals. M. Satô 4292
Cubical Atom Domains in the Crystal Structure of Metals. R. Reinicke 4293
Statistical Theory of Superlattices with Long-Range Interaction. Parts I and II. J. S. Wang 4294
Crystallographic Radii. H. Jensen, G. Meyer-Gossler and H. Rohde 4754
Classification of Solids. W. Nowacki 4755
Graphical Representation of the Possibilities of Rotation Axis Combinations. H. Tertsch 4756
Vector Maps and Crystal Analysis. I. Langmuir and D. Wrinch 4757
Potential Energies of Alkali Halides—Errata and Extension of the Semi-Empirical Formula. A. May 4758

2. Crystal Structure.

(a) Metals and Alloys.

Debye-Scherrer Patterns of Germanium between 20° and 1110° Abs. H. Nitka 30
Structures of Iron Films Deposited on Crystals of Alkali Halides. S. Shirai 81
Structural Investigation of Evaporated Metal Films. O. Rüdiger 82
Crystal Structure and Ferromagnetism of Alloys. U. Dehlinger 421
Structure of Uranium. C. W. Jacob and B. E. Warren 422
Superstructures in Alloy Systems. F. C. Nix 423
Grain-Like Structure of Solids. W. H. Bragg 929
X-Ray Examination of System Mn-P. O. Årstad and H. Nowotny 930
Nature of Intermetallic Compounds of Type Mg_2Sn. W. Hume-Rothery and G. V. Raynor 931
X-Ray Examination of System Cr-As. H. Nowotny and O. Årstad 1397
Grain-Growth of Micro-Crystals in Drawn Al Wire. T. Fujiwara and Y. Umemoto 1398
Structure and Optics of Evaporated Metal Films. G. Hass 1490
Structure of Intermetallic Compounds of Rare-Earth Elements. A. Iandelli and E. Botti 1787
Order-Disorder Transformations in Alloys. F. C. Nix and W. Shockley 1788
Quantitative Measurements of Texture by the Magnetic Torque Method. L. P. Tarasov 1789
X-Ray Study of the Superlattice in Certain Alloys. E. A. Owen and I. G. Edmunds 1790
Structure of Steel at Fracture. H. J. Gough and W. A. Wood 1816
Influence of Rate of Loading on Yield Point and Ultimate Stress. C. F. Elam 2256
Ferromagnetism and Structure of Manganese Ferrites. A. Kussmann and H. Nitka 2628
Perturbations in Crystal Lattices. J. Cichocki 2668
Electronic Structure of Alloys. T. Muto 2669
$\alpha \rightleftharpoons \beta$ Transformation in Manganese. G. Johannsen and H. Nitka 2670

Crystal Structure and Special Properties, *continued*.

Abstract Nos.

X-Ray Study of the Fe-Ni-Al Ternary Equilibrium Diagram. A. J. Bradley and A. Taylor 2671
Atomic Rearrangement Process in the Copper-Gold Alloy Cu$_3$Au. Part II. F. W. Jones and C. Sykes 2672
X-Ray Study of Lattice-Distortion in Rhodium. G. W. Brindley and P. Ridley 2673
Structure of Cd-In Alloys Rich in In. W. Betteridge 2674
Lattice Disturbances, Particle Size and Thermal Content of Pyrophoric Iron. R. Fricke, O. Lohrmann and W. Wolf 2940
Magnetic and X-Ray Examination of Ni-Pt Alloys. A. Kussmann and H. Nitka 3018
Magnetic Structure of Co. W. C. Elmore 3019
New Type of X-Ray Diagram. A. Guinier 3057
Atomic Vibrations of a Zn-Cu Alloy. R. A. Howard 3058
Moment of Cubic Single Crystals in a Magnetic Field. H. Mussmann and H. Schlechtweg 3400
Atomic and Ionic Radii. Parts I and II. W. Hume-Rothery and G. V. Raynor. Part III. G. V. Raynor 3442
X-Ray Spectrum and Structure of Cu and Ni in Cu-Ni Alloys. J. Farineau and M. Morand 3462
X-Ray Study of System Ni-P. H. Nowotny and E. Henglein 3463
X-Ray Investigations in the Systems Mn-Bi, Co-Sb, Ni-Sb. U. Fürst and F. Halla 3464
Sub-Microscopic Twinning in Nickel. G. Menzer 3465
Lattice Constant of Silver at High Temperatures. W. Hume-Rothery and P. W. Reynolds 3466
Structure of Thin Ni and Ag Films. G. Menzer 3467
Optical Constants, Electrical Resistance and Structure of Thin Metal Films. J. Krautkrämer 3468
Electrical Conductivity and Phase Diagram of Ni-Mo Alloys. G. Grube and H. Schlecht 3809
Magnetic Susceptibility and Phase Diagram of Ni-Mo Alloys. G. Grube and O. Winkler 3847
Al-Mg System. F. Laves and K. Moeller 3909
X-Ray Investigation of Slowly Cooled Cu-Ni-Al Alloys. A. J. Bradley and H. Lipson 3910
Lattice Constants of Non-Cubic Substances (Bi, Mg, Sn) by the Asymmetric Method. A. Ieviņš, M. Straumanis and K. Karlsons 3911
Structure of Co$_2$Al$_5$. A. J. Bradley and C. S. Cheng 3912
X-Ray Study of Ag-Zn Alloys. E. A. Owen and I. G. Edmunds 4295
Structure of Electrolytic Lead Deposited from Nitrate Solutions. S. Yamamori and S. Yoshimoto 4296
Submicroscopic Twinning in Metals. F. Kirchner and H. Cramer 4297
Electrical Conductivity and Phase Diagram of Ba Alloys with Bi, Mg, and Pb. G. Grube and A. Dietrich 4639
Diffraction of X-Rays by an Age-Hardening Cu-Al Alloy. G. D. Preston 4759
Structure of Fe-Pd Superlattices. R. Hultgren and C. A. Zapffe 4760
X-Ray Test of Superstructure in FeNi$_3$. F. E. Haworth 4761

(*b*) *Inorganic.*

Structure of Zinc Meta-Antimonate. G. L. Clark and D. A. Reynolds 31
Occurrence of "Forbidden" X-Ray Reflections. E. Brandenberger 236
Temperature Variation of Thermal Conductivity and X-Ray Structure of Micas. Part I. Thermal Conductivity up to 600° C. R. W. Powell and E. Griffiths. Part II. X-Ray Examination of Structure. W. A. Wood 246
Structure of Boron Nitride. A. Brager 424
Two-Dimensional Crystals of Silica. N. A. Shishacow 425
Structure of Potassium Dihydronium Pentaborate, KH$_2$(H$_3$O)$_2$B$_5$O$_{10}$. W. H. Zachariasen 426
Precision Pyknometric Method for Liquids and Solids. T. Batuecas and F. L. Casado 439
Infra-Red Spectrum and Structure of Silicates and Glasses. F. Matossi 736
Structure of Compounds of Rare Earths with Bismuth. A. Iandelli and E. Botti 932
Structure of Ammonium Chlorobromoiodide. R. C. L. Mooney 933
Structure of Sulphur. J. J. Trillat and S. Oketani 934
Crystal Chemistry of Non-Metallic Inorganic Substances. F. Machatschki 1399
Structure of Germanous Iodide. H. M. Powell and F. M. Brewer 1400

Crystal Structure and Special Properties, *continued.*

Abstract Nos.

Configuration of a Pentahalogen Anion Group from the X-Ray Structure Determination of Potassium Tetrachloriodide Crystals. R. C. L. Mooney 1401
Oxygen Parameters in Sodium Periodate. E. A. Hazlewood 1402
Structure of Solid Helium. W. H. Keesom and K. W. Taconis 1403
Variations of Lattice Dimensions Produced by Electrostatic Forces in Piezoelectric Crystals. V. Dolejšek and M. Jahoda 1758
Debye-Scherrer Photographs of Liquid Helium. W. H. Keesom and K. W. Taconis 1791
Structure of Sodium Metaborate $Na_3(B_3O_6)$. Ssu-Mien Fang 2239
Structure of $AgMnO_4$. K. Sasvári 2240
Structure of Cæsium Chromate, Cs_2CrO_4. J. J. Miller 2241
Crystal-Size in Metal and Metal-Oxide Smokes. D. Beischer 2665
Accurate Determination of Lattice Constants of Hygroscopic LiCl and NaBr. A. Ieviņš, M. Straumanis and K. Karlsons 2675
Changes in Parameter of Alkali Halogen Lattices Due to Foreign Ions. E. Saur and O. Stasiw 2676
Structure of Sodium Isocyanate. M. Bassière 2677
Structure of Rubidium Dithionate. W. H. Barnes and A. V. Wendling 2678
Structure of Talc and Pyrophyllite. S. B. Hendricks 3059
Clay. W. H. Bragg 3169
Monotropy of Ice at Atmospheric Pressure (Ice VIII). E. Cohen and C. J. G. van der Horst 3469
α-β Transformation in Quartz. H. E. v. Steinwehr 3470
Variations of Crystalline Parameter of CdO by Insertion of Cd Atoms in its Lattice. R. Faivre and A. Michel 3471
Reciprocal and Bravais Lattices of Axinite. W. F. de Jong 3472
Polymorphism of MnSe. A. Baroni 3473
Structure of EuS. W. Nowacki 3474
Structure of Bismuth Trioxide. L. G. Sillén 3475
Structure of $CuCl_4 \cdot 2NH_3 \cdot (NH_4)_2$. A. Silberstein 3476
Electrolytic Conduction in Solids and Crystal Structure. J. A. A. Ketelaar 3810
Structure of KHF_2. V. Caglioti and G. Giacomello 3913
Structure of $Cs_2AuAuCl_6$, and $Cs_2AgAuCl_6$. N. Elliott and L. Pauling 3914
Comparison of Rotated-Crystal and Powder Methods. M. Straumanis and A. Ieviņš 3916
Polymorphic Transitions in Metallic Halides. R. B. Jacobs 4298
Order Versus Disorder in Ternary Structures Including Certain Spinels. F. C. Blake 4299
Reflection Patterns of X-Rays with Crystals. T. Fujiwara and I. Takesita 4570
Effect of a Direct Electric Field on Laue Diffraction Photograms. A. Němejcová and J. Brož 4571
Hydrous Oxide Hydrosols and Gels. A. Ganguli 4753
Infra-Red Spectrum and Structure of Glasses. F. Matossi 4942

(*c*) *Organic.*

X-Ray and Electron-Interference Methods of Determining Molecular Structure of $C(CH_2X)_4 \cdot (X = Cl, Br \text{ or } I)$. O. Hassel and L. C. Strömme 935
Structure of Pentaerythritol Tetracetate. T. H. Goodwin and R. Hardy 936
X-Ray Analysis of Dibenzyl Series. Part V. Tolane and the Triple Bond. J. M. Robertson and I. Woodward 937
Structure of Insulin. Part I. D. Crowfoot 938
Structure and Thermodynamic Properties of Long-Chain Compounds. Parts I and II. A. R. Ubbelohde 1251
Structure of Cellulose and Rubber. H. Mark and K. H. Meyer 1389
Length of Aliphatic Carbon Bond. C. H. MacGillavry 1404
X-Ray Examination of Single Crystals of Cetyl Palmitate. R. Kohlhaas 1405
Structure of Benzil. K. Banerjee and K. L. Sinha 1406
Structure of Acetaldehyde-Ammonia $(CH_3 \cdot COH \cdot NH_3)$. N. F. Moerman 1407
X-Ray Structure of Pentaerythritol, $C(CH_2OH)_4$. I. Nitta and T. Watanabé 1792
X-Ray and Optical Properties of Barium-Copper-Stearate Films. C. Holley 1866
Structure of Long-Chain Acids. G. Giacomello 2242
Structure of Trisodium-Tricyanmelamine Trihydrate. J. L. Hoard 2679
Structure of Bromo-Cupric Compounds. A. Silberstein 2680
Structure of Cyanuric Acid $(HCNO)_3$. E. H. Wiebenga and N. F. Moerman 2681
Crystallographic Investigations in Terpene Chemistry. G. Giacomello 2682
Polymorphic Forms of Long-Chain Hydrocarbons. T. Schoon 2683
Structure of Benzophenone. K. Banerjee and A. Haque 3060

For the **Key** to this Index see pp. 1182 to 1194.

Crystal Structure and Special Properties, *continued.*

Abstract Nos.

New Form of Resorcinol. Part I. Structure. Part II. Thermodynamic Properties. J. M. Robertson and A. R. Ubbelohde 3061
Structure of Condensed Ring Compounds. Part VI. 1 : 2-Benzanthracene, 5-Methyl-1 : 2-Benzanthracene and 3-Methyl-1 : 2-Benzanthraquinone. J. Iball 3062
Test of Alternative Structures Proposed for Cellulose. S. T. Gross and G. L. Clark 3451
Structures of Trimethylstibine Dihalides $(CH_3)_3SbX_2$. A. F. Wells 3477
Structure of Bridged Palladium Compounds. A. F. Wells 3478
Structure of 9 : 10-Dihydroanthracene and 9 : 10-Dihydro-1 : 2 : 5 : 6-Dibenzanthracene. J. Iball 3479
Structure of Diketopiperazine. R. B. Corey 3480
Structure of Anthraquinone. B. C. Guha 3481
Space-Group of Creatinine. K. Banerjee and A. Haque 3482
Space-Group and Atomic Arrangements in Phloroglucine Dihydrate. K. Banerjee and R. Ahmad 4300
Structure of the Insulin Molecule. D. M. Wrinch and I. Langmuir 4301
Structure of Tricyanobromomethane. W. Fensch and G. Wagner 4302
Structure of Cyclohexane and Derivatives. O. Hassel and A. M. Sommerfeldt 4303
Structure of Aliphatic Compounds: n-$C_{30}H_{62}$. R. Kohlhaas and K. H. Soremba 4762

(*d*) *Biological.*

Structure of Animal Tissues. F. O. Schmitt 32
X-Ray Diffraction Studies on Human Bone. L. Reynolds, H. S. Hayden and K. E. Corrigan 1408
Structure of Dental Enamel. M. Harders-Steinhäuser 2243

3. Liquid Crystals and Liquid Structure.

Presence of Crystallisation Nuclei above the Melting Point and the Structure of Liquids. V. Danilow and W. Neumark 33
Liquid Crystals Obtained by Sublimation. P. Gaubert 427
Reciprocal Effect of Molecules in Anisotropic Liquids. W. Kast and W. Maier 428
Formation and Orientation of Soft Cross-Twinned Crystals in Anisotropic Liquid Drops of p-Azoxyanisole. P. Gaubert 939
Effect of Temperature on the Atomic Distribution in Liquid Sodium. F. H. Trimble and N. S. Gingrich 1409
Fourier Analysis of Liquid Methyl Alcohol. G. G. Harvey 1410
Structure of Liquid Metals near Crystallisation Point. V. J. Danilow and J. V. Radtschenko 1793
X-Ray Examination of Liquid Metallic Eutectics. V. J. Danilow and J. V. Radtschenko 1794
Action of Magnetic Field on Viscosity of *p*-Azoxyanisole. W. N. Zwetkoff and G. M. Michailoff 1880
Preparation for the Formation of New Phases. A. Smits 2086
Existence in Liquids of Intermolecular Coupling of the Second Kind. A. Piekara 2141
Rôle of Impurities in the Structure of Liquid Crystals. P. Gaubert 2244
Continuum and Swarm Theories of the Nematic Phase. H. Zocher 2245
X-Ray Studies on Liquids: Inner Peak for Alcohols and Acids. W. C. Pierce and D. P. MacMillan 2246
Theory of the Liquid State. H. G. Trieschmann 2247
Solubility and its Variation. H. G. Trieschmann 2292
Constitution of Heavy Water. I. R. Rao and P. Koteswaram 2654
Theory of Liquids. A. Ganguli 2684
Dipole Interaction in Mixtures of Water with Methyl, Ethyl, and *n*-Propyl Alcohols, and of Ethyl Alcohol with *n*-Heptane. A. R. Martin and A. C. Brown 2953
Surface Tensions of Liquid Crystals. A. Ferguson and S. J. Kennedy 3117
Quasi-Crystalline and Crystalline Liquids. F. C. Frank 3483
Effect of Temperature on Atomic Distribution in Liquid Potassium. C. D. Thomas and N. S. Gingrich 3484
Infra-Red Study of Liquid Crystals. R. Taschek and D. Williams 3917
Colloidal Structure of Rubber in Solution. S. D. Gehman and J. E. Field 4289
Diffraction of X-Rays in Organic Glasses. T. M. K. Nedungadi 4304
Double Refraction of Anisotropic Liquids. W. Kast 4305

For the **Key** to this Index see pp. 1182 to 1194.

Crystal Structure and Special Properties, *continued*.

Abstract Nos.

Calorimetric Measurements during Transition from the Anisotropic to the Isotropic Phase. C. Kreutzer 4306
Field Strength Dependence of the Dielectric Constant of p-Azoxyanisole. W. Maier 4307
Free Volumes and Free Angle Ratios of Molecules in Liquids. J. F. Kincaid and H. Eyring 4330
Non-Aqueous Solutions. V. A. Plotnikov 4352
Recent Work in Infra-Red. F. Matossi 4562
X-Ray Analysis of Structure of Water. J. Morgan and B. E. Warren 4763
Structure of Nematic Layers. H. Zocher and G. Ungar 4764
Formation of Surfaces in Liquid-Liquid Mixtures. W. W. Lepeschkin 4999

4. Morphology of Crystals (Crystal Form, Habit, Growth).

Nucleus Formation on Recrystallisation. Part VI. M. Kornfeld and W. Pawlow 34
Preparation of Large Single Crystals of Sodium Chloride. H. Walther 35
Zircon of Lower Density. J. Lietz 36
Structural Formulæ and Classification of the Clays. J. de Lapparent 37
Polymorphism in Leucite. J. Wyart 429
Crystalline Boric Oxide. L. McCulloch 430
Production of Large Single Crystals of KBr for Optical Use. D. C. Stockbarger 431
Sugar Crystals. J. Schmutzer 432
Theory of Twin Formation. Part II. I. Schaacke 433
Crystal Growth from Solutions. W. F. Berg 434
Theory of Twin Formation. Part III. I. Schaacke. 940
Parallel Growths. L. Royer 941
Crystal Habit and Intermolecular Forces in Homopolar Crystals. I. N. Stranski 1411
Anisotropy in Rate of Growth of New Nuclei during Recrystallisation. Part II. M. Kornfeld and F. Rybalko 1795
Mixed Crystals in System $KClO_3$-$KMnO_4$. Part II. H. Seifert 1796
Crystal Growth on Calcite Surfaces. G. I. Finch and E. J. Whitmore 2248
Artificial Production of Snow Crystals. M. Perutz.... 3174
Crystallisation of Rubber through Pressure. P. A. Thiessen and W. Kirsch .. 3454
Crystallisation of Alkali Halogen Salts on Fluorite. L. Krastanow and I. N. Stranski 3485
Variation of Elastic Constants of Crystalline Sodium with Temperature beween 80°K and 210°K. S. L. Quimby and S. Siegel 3500
Etch Figures of Quartz. W. L. Bond 3918
Magnetically Orientated Bismuth. A. Altma 4243
Crystallisation in Stretched Rubber. P. A. Thiessen and W. Wittstadt 4291
Production of Long Single Crystals of Aluminium Drawn Wire. T. Fujiwara and T. Hudita 4308
Low-Temperature Transformation of ND_4Br. Part I. A. Smits, D. Tollenaar and F. A. Kröger 4309
Polymorphic Transformation of Mercuric Iodide. D. G. Eade and N. H. Hartshorne 4765
Growth of Large Crystals of Potassium Bromide. K. Chamberlain 4766
Crystal Growth of NaCl. K. Spangenberg 4767

5. Special Properties.

Quantum Efficiency of Colour Centre Building in KCl and NaCl. G. Schaitberger 38
Elastic Constants of Anisotropic Solids. H. A. Jahn.... 47
Coloration and Luminescence of Fluorite. E. W. Kellermann 164
Influence of Temperature on Primary Photoelectric Current in Alkali Halide Crystals. G. Glaser 380
Secondary Photoelectric Current. R. Hilsch and R. W. Pohl 381
Effect of a Groove on the Strength of Rock-Salt. Part II. A. W. Stepanow 435
Thermal Conductivity of Diamond and Potassium Chloride. W. J. de Haas and T. Biermasz.... 760
Electron Conduction and Photochemical Reactions in Alkali Halide Crystals. R. W. Pohl 1277
Wiedemann-Franz Law in Crystals. M. Kohler 1287

Crystal Structure and Special Properties, *continued.*

Abstract Nos.

Theory of Absorption and Dispersion in Paramagnetic Crystals under Alternating Magnetic Fields. R. de L. Kronig 1292
Diamagnetic and Paramagnetic Anisotropy of Crystals. K. Lonsdale 1334
Influence of Crystal Lattice on Thermionic Emission. B. Mrowka 1360
Theory of Thermionic Emission. W. Schottky 1361
Surface Phenomena in Crystallisation of Under-Cooled Liquids in Thin Layers. Part II. G. L. Michnewitsch and I. E. Browko 1797
Compressibilities of Fourteen Substances to 45,000 kg./cm^2. P. W. Bridgman 1798
Polymorphic Transitions up to 50,000 kg./cm^2. of Several Organic Substances. P. W. Bridgman 1799
Influence of Temperature on the Excitation of Colour Centres. H. Pick 1967
Propagation of Light in an Atomically Stratified Medium. J. Weigle 1976
Thermal Conductivity of Crystals at Low Temperatures. W. J. de Haas and T. Biermasz 2071
Velocity of Sound in Single Crystals of Bismuth. A. B. Focke, R. B. Lindsay and C. R. Wilks 2100
Magne-Crystallic Action. Part V. Paramagnetic Salts of the Rare-Earth and the Iron Groups. K. S. Krishnan and A. Mookherji 2176
Photochemical Processes in Crystals. R. Hilsch and R. W. Pohl 2249
Reflection by Crystals in Far Ultra-Violet. G. Rathenau 2443
Transition Temperature of $Na_2SO_4,7H_2O$. E. R. Washburn and W. J. Clem 2505
Peculiarities of Hall Effect in Zn Single Crystals. M. M. Noskov 2613
Change of Resistance of Zn Single Crystals in a Magnetic Field. B. G. Lasarew and M. M. Noskov 2614
Internal Periodic Potential of Crystals. A. Hautot and J. J. Trillat 2685
Atomic Foundation of Plasticity of Crystals. A. Kochendörfer 2695
Propagation of Light in an Atomically Stratified Medium. Part II. J. Weigle and J. Patry 2846
Crystallisation and Thermomagnetic Anomaly of Lepidocrocite. A. Michel and M. Gallissot 3021
Optical Crystallographic Studies with the Polarising Microscope. Part I. W. M. D. Bryant 3063
Heat Capacities of Crystals at Low Temperatures. S. C. Sirkar and J. Gupta 3293
New "Rochelle-Electrics." G. Busch 3369
Photochemical Processes in Crystals. R. Hilsch and R. W. Pohl 3678
Dependence on Thickness of the Thermal Resistance of Crystals at Low Temperatures. W. J. de Haas and T. Biermasz 3762
Magnetic Anisotropy in Ferromagnetic Crystals in Weak Fields. E. Kondorsky 3845
Absorption of Light by Crystals. N. F. Mott 4069
Ray-Surface and Optical Indicatrix. G. Tunell 4113
Magnetic Anisotropy in Ferromagnetic Crystals in Weak Fields. Parts II and III. E. Kondorsky 4239
Magnetic Studies on Rhodochrosite, $MnCO_3$. K. S. Krishnan and S. Banerjee 4245
Nature of Excited Centres in Alkali Halide Crystals. H. Wolff 4310
Magnetic Anisotropy and Structure of $CuSO_4 \cdot 5H_2O$. Part II. K. S. Krishnan and A. Mookherji 4311
Diffusion of Water in Crystals. H. Kraft 4771
Expansion of Crystals in Relation to their Structure. H. D. Megaw 4982
Suitability of Diamagnetic Crystal for Magnetic Field Measurement. R. G. Stansfield 5061

7. Unclassified.

Crystal Adjustment for Oscillation X-Ray Photographs. O. P. Hendershot 39
Correlation of Fluidity Curves with Freezing-Point Curves in Binary Systems. R. H. Ewell 249
X-Ray Photography of Reciprocal Lattice. W. F. de Jong and J. Bouman 1412
X-Ray Photography of Zero-Order Reciprocal Net Planes of a Crystal. W. F. de Jong, J. Bouman and J. J. de Lange 1413
Evaluation of X-Ray Reflections from Crystalline Powders. J. C. M. Brentano 1414
X-Ray Photography of Reciprocal Lattice Planes. W. F. de Jong and J. Bouman 1800
X-Ray Detection of Lattice Distortion and Determination of Particle Size. R. Fricke 2490
X-Ray Measurement of Particle Size. F. W. Jones 2491

For the **Key** to this Index see pp. 1182 to 1194.

Crystal Structure and Special Properties, *continued.*

Abstract Nos.

Integration of Large Numbers of X-Ray Crystal Reflections. R. H. V. M. Dawton 4312

Surface Structure and Properties of Electrolytic Cr. M. Cymboliste 1106B
Graphical Representation of the Lever Law in Heterogeneous Equilibria. R. Bertschinger 3367B

Density.

1. Density of Gases and Vapours.
2. Density of Liquids.
3. Density of Solids.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

1. Density of Gases and Vapours.

Physical Constants of Krypton. E. Mathias, C. A. Crommelin and J. J. Meihuizen 438
Correction for Adsorption in the Method of Determining Limiting Densities. E. Moles 943
Effusion-Meter Jet. E. Lehrer and R. Riedmiller 959
Molecular Weights of Gases by the Method of Limiting Densities. E. Moles 1801
Determination of Molar Weights of Vapours near the Boiling Point. J. D. Ingle and H. P. Cady 1802
Determination of the Vapour Densities of Indigo and Other Organic Compounds by Means of a Spoon Gauge. C. E. Dent and R. P. Linstead 2686
Limiting Density of SO_2. E. Moles, T. Toral and A. Escribano 3064
Limiting Densities of O_2 and CO_2. Atomic Weight of Carbon. E. Moles and A. Escribano 3486
Complexity of P_2O_5. A. Smits, J. A. A. Ketelaar and J. L. Meijering 4281
Complexity of Aluminium Chloride. A. Smits, J. L. Meijering 4282
Refraction, Dispersion, and Related Properties of Pure Hydrocarbons, Arranged for Use in the Analysis of Hydrocarbon Mixtures. A. L. Ward and S. S. Kurtz, Jr. 4931

2. Density of Liquids.

Refractivity Intercept. S. S. Kurtz, Jr., and A. L. Ward 193
Isotopic Constitution of Snow and Mountain River Water. A. E. Brodsky, O. C. Scarre, E. I. Donzowa and M. M. Sluckaia 395
Precision Pyknometric Method for Liquids and Solids. T. Batuecas and F. L. Casado 439
Refractivity Intercept. Part II. S. S. Kurtz, Jr., and A. L. Ward 679
Surface Tension Constants of the Polyethylene Glycols and Their Derivatives. A. F. Gallaugher and H. Hibbert 1488
Density and Refractive Index of very Dilute, Aqueous Solutions of Strong Electrolytes. W. Prang 2250
State of Solution of Soaps. Part I. Specific Volume of Dilute Sodium Oleate Solutions. M. Ulmann 2663
Density of Aqueous Solutions of HCl. G. Åkerlöf and J. Teare 2687
Intermolecular Forces. J. N. Friend 3443
Densities of NaCl and KCl Solutions at 0° C. T. Batuecas 3487
Density of Solutions of Organic Acids in Benzol, Dioxane and Cyclohexane. G. Schulz 3488
Densities of D_2O and H_2O: Electrolytic Separation of Oxygen Isotopes. L. Tronstad and J. Brun 3489
Density of Tap-Water from Osaka, Japan, and Cambridge, U.S.A. T. Titani and N. Morita 3490
Isotopic Ratio in Ordinary Water. N. Morita and T. Titani 3491
Molecular Volumes and Parachors of Mercuric Halides and their Group Relationships. E. B. R. Prideaux and J. R. Jarratt 3981
Viscosity and Density of Aqueous Solutions of Weak Electrolytes at 35° C. M. K. Srinivasan and B. Prasad 3983
Physical Properties of Cyclo-Pentane, -Hexane and -Heptane and Derivatives. A. I. Vogel 4366
Physical Chemical Properties of cis- and trans-Decahydronaphthalene. W. F. Seyer and R. D. Walker 4580

Density, *continued.*

Abstract Nos.

Dielectric Properties of Some Organic Substances. G. R. Paranjpe and D. J. Davar 4648
Measurement of Surface Tension and Density. E. Tyler 4820

3. Density of Solids.

Zircon of Lower Density. J. Lietz 36
Crystalline Boric Oxide. L. McCulloch 430
Precision Pyknometric Method for Liquids and Solids. T. Batuecas and F. L. Casado 439
Density of Glass by the Additive Rule. P. Barry and J. Herbert 4768

Dielectrics and Capacitance.

1. Theory.
2. Dielectric Constants and Electric (Dipole) Moments:
   (*a*) Gases.
   (*b*) Liquids and Colloids.
   (*c*) Solids.
3. Effects of Electric and Magnetic Fields.
4. Effect of Frequency.
5. Effects of Mechanical Stress, Temperature and Moisture.
6. Dielectric Loss.
7. Capacitance and its Measurement.
8. H.F. Measurements (*see also* Alternating Current Networks).
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References:
Conduction, Electrical, in Dielectrics, *see* Conduction (Electric) in Solids and Liquids.
Electric Breakdown, *see also* Section B.—Electrical Engineering.

1. Theory.

Distribution of Electricity on Two Cylinders. E. P. Adams 348
Polarities of Covalent Bonds. C. P. Smyth 1291
Theory of Absorption and Dispersion in Paramagnetic Crystals under Alternating Magnetic Fields. R. de L. Kronig 1292
Theory of Schiller Layers. P. Bergmann, P. Löw-Beer and H. Zocher 1304
Dielectric Constant of a Gas under High Pressure. M. Kubo 2140
Existence in Liquids of Intermolecular Coupling of the Second Kind. A. Piekara 2141
Solvent Effect in Dielectric Polarisation. Part III. G. Thomson 2570
Thermal Conductivity of Gaseous Hydrocarbons and Atomic Polarisation. R. Delaplace 3297
Solid Dielectrics in the Alternating Field. F. Bourgnis 3364
Dielectric After-Effects in Solid Non-Conductors. G. M. Voglis 3365
Rotation of Molecules in Polar Liquids. S. Oka 3366
Dielectric Constant of Dipole Liquids. C. J. F. Böttcher 3367
Calculation of Polarisability of a Molecule. M. M. Biedermann 3816
Molecular Models of Dielectrics. L. Hartshorn 4209
Interaction between Solutes and Polar Solvents. W. J. Dunning and W. J. Shutt 4351
Dipole Moments of Molecules Containing Two Movable Dipoles. J. Y. Beach and D. P. Stevenson 4645
Internal Rotation in Ethylene Chloride. J. Y. Beach and K. J. Palmer 4646
Anomalous Dispersion and Free Rotation. A. Budó 5037

2. Dielectric Constants and Electric (Dipole) Moments.

(*a*) *Gases.*

Dielectric Constant of a Space Containing Electrons. S. P. Prasad and M. V. Verma 313
Dipole Moments of Vapours. Parts IV, V and VI. L. G. Groves and S. Sugden 829
Dielectric Polarisation and Form of CO_2 Molecule. K. L. Ramaswamy 903
Dielectric Constant of BCl_3 and $AsCl_3$ Vapours. U. Grassi 2571
Dielectric Constants of Ionised Gases. Part II. S. Gangopadhyaya and S. R. Khastgir 2984
Conductivity and Dielectric Constant of an Electron Stream. H. E. Hollmann and A. Thomas 3797
Dielectric Constants of Fluorine Compounds. R. M. Fuoss 3817
Electric Moments of Methyl and Ethyl Alcohols. J. D. Stranathan 3818
Electric Moments of NO_2 and N_2O_4 Molecules. R. W. Schulz 3819

Dielectrics and Capacitance, *continued.*

Abstract Nos.

Dipole Moments of Vapours. Part VII. L. G. Groves 4210
Dipole Moments of HCl and DCl. R. P. Bell and I. E. Coop 4647

(*b*) *Liquids and Colloids.*

Molecular Association of Bromobenzene and Other Halogenated Benzene Derivatives. P. Trautteur 10
Experimental Tests of Salting-Out Theories. P. S. Albright 70
Dielectric Constants of Solutions of Amphoteric Electrolytes. Part III. H. Linhart 314
Dielectric Polarisation and Viscosity of Liquid Chloronitrobenzene. A. Jagielski 315
Dielectric Properties of Acetylene Compounds. Part IX. H. L. Goebel and H. H. Wenzke 316
Dielectric Measurements on Hydrophilic Colloids. Part II. P. J. Denekamp and H. R. Kruyt 317
Dipole Moment of a Diatomic Molecule in Non-Polar Solvent. F. Fairbrother 318
Molecular Interactions and Chemical Affinity. P. Girard and P. Abadie 403
Molecular Interaction and Polarisability. A. Michels, J. de Boer and A. Bijl 404
Surface Tension of Liquid Fluorine and Dielectric Constants of Liquid O_2, F_2, Cl_2 and HCl. E. Kanda 491
Determination of Binding Moment by Infra-Red Absorption Measurements. R. Mecke 707
Vibration Spectra and Electric Moments of Azomethane, N-N′Dimethylhydrazine and Acetaldazine. W. West and R. B. Killingsworth 708
Dipole Moments of Aromatic Diazoamino-Compounds. R. J. W. Le Fèvre and H. Vine 830
Solvent Effect in Dipole-Moment Measurements. Part I. Polarisation of CCl_4 Solutions. F. R. Goss 831
Dielectric Constant and Particle Size. N. M. Li and J. W. Williams 832
Dielectric Measurements of Hydrophilic Colloids. Part III. H. R. Kruyt and J. T. G. Overbeek 833
Frictional Dispersion of the Dielectric Constants of Organic Fluids. E. Plötze 834
Influence of Strong Electrolytes on the Dielectric Constant of Water. A. Blicher 1293
Properties of Carbon-Halogen Bond in Aliphatic Compounds. J. M. Stevels 1375
Dielectric Constant Study of ω-Hydroxydecanoic Acid Polymers. J. Wyman, Jr. 1716
Dielectric Properties of Aqueous Solutions of Salts. W. J. Dunning and W. J. Shutt 1717
Dielectric Constants of Zwitter-Ions and Polar Molecules as Related to pH. W. J. Dunning and W. J. Shutt 1718
Dipole Moments of Unsaturated Compounds. Part II. M. Gorman, R. M. Davis and P. M. Gross 1719
Quantum Mechanical Resonance and Internal Rotation. S. Mizushima and M. Kubo 2049
Dipole Moment and Free Rotation. A. Riedinger 2572
Measurement of Superficial Electric Moments in the Midst of a Liquid. N. Choucroun and M. Arditi 2741
Dipole Interaction in Mixtures of Water with Methyl, Ethyl, and n-Propyl Alcohols, and of Ethyl Alcohol with n-Heptane. A. R. Martin and A. C. Brown 2953
Dielectric Constant of D_2O. J. Wyman, Jr. and E. N. Ingalls 2985
Electric Moment of Aliphatic Alcohols, Acids, and Esters at Cellulose and Aluminium Oxide Interfaces. M. A. Lauffer and R. A. Gortner 3123
Dielectric Behaviour of the Hydroxides, Oxyhydrates and Oxides of Fe, Be and Mg. O. Glemser 3368
Series Effect on Dipole Moments of Alkyl Halides in Solution. E. G. Cowley and J. R. Partington 3820
Dielectric Properties of Carbohaemoglobins. S. Arrhenius 3821
Change in Dielectric Constant at Freezing Point of Homopolar Liquids. R. Guillien 4211
Dielectric Constant of Pure Organic Liquids. R. J. W. Le Fèvre 4212
Field Strength Dependence of the Dielectric Constant of p-Azoxyanisole. W. Maier 4307
Free Volumes and Free Angle Ratios of Molecules in Liquids. J. F. Kincaid and H. Eyring 4330

Dielectrics and Capacitance, *continued*.

Abstract Nos.

Dielectric Properties of Some Organic Substances. G. R. Paranjpe and D. J. Davar 4648
Dielectric Properties of Acetylenic Compounds. Part X. F. J. Krieger and H. H. Wenzke 4649
Electric Polarisations of Metallic Acetylacetonates. A. E. Finn, G. C. Hampson and L. E. Sutton 4650
Electric Moments of *p*-Benzoquinone and Related Compounds. D. L. Hammick, G. C. Hampson and G. I. Jenkins 4651
Electric Polarisations of Substances having Anomalous Dipole Moments, and their Bearing on the Theory of Atom Polarisation. I. E. Coop and L. E. Sutton 4652
Dipole Moments of Aliphatic and Aromatic Aldehydes and of Anthrone. D. I. Coomber and J. R. Partington 4653
Frictional Dispersion of Dielectric Constants of Organic Liquids. E. Plötze 4654
Dipole Rotation in Solutions. P. Girard and P. Abadie 5038
Solvent Effect on Dipole Moments of Amines. E. G. Cowley and J. R. Partington 5039

(*c*) *Solids*

Dielectric Constant Measurements on Solids. D. Doborzyński 319
Dielectric Behaviour of Solid HBr in the Transition Interval near 89° Abs. G. Damköhler 1294
Electrical Properties of Solids. Parts II and III. R. M. Fuoss 1720
Dielectric Constant of Metallic Suspensions and the Measurement of Ore Content. H. Löwy and M. M. Ghali 1928
Effect of Hydrostatic Pressure on the Susceptibility of Rochelle Salt. D. Bancroft 2142
Relaxation Time in Rochelle Salt Crystals. Part II. R. D. Shulvas-Sorokin 2197
E.H.F. Electrical Constants of Soil. M. K. Chakravarty and S. R. Khastgir . . 2355
Dielectric Constant of Rochelle Salt. D. Doborzyński 2573
Dielectric Properties of Manganese Ferrites. E. Blechschmidt 2574
Dielectric Polarisation of *n*-Long Chain Ketone. A. Müller 2575
Dielectric Constant and Conductivity of Soil at High Radio Frequencies. S. S. Banerjee and R. D. Joshi 2792
Permanent Electric Moments of Alkali Metal Halides. T. Trautteur 2986
Possibility of Molecular Rotation in the Solid Forms of Cetyl Alcohol and Three Long-Chain Ethyl Esters. W. O. Baker and C. P. Smyth 2987
New "Rochelle-Electrics." G. Busch 3369
Conductivity and Dielectric Constants of Crystals. M. G. Rahimi 4207
Dipole Moments and Molecular Structure. E. Bergmann and A. Weizmann 4213
Dielectric Constant of Cellulose. H. A. De Luca, W. B. Campbell and O. Maass 4655

3. Effects of Electric and Magnetic Fields.

Influence of Magnetic Fields on the Heat Conductivity of Gases. Part IV. H. Senftleben and J. Pietzner 244
Influence of Electric and Magnetic Fields on Electric Sparks in Air at Atmospheric Pressure. L. Bull and P. Girard 288
Breakdown of Insulating Materials. Electric Strength. L. Hartshorn 1295
Dielectric Polarisation in Liquids in Asymmetric Fields. F. H. Müller 2143
Electrical Breakdown of Alkali Halides. R. J. Seeger and E. Teller 4656
Polymerisation of Styrolene in 50-Cycle Electric Fields and of Oil in Condensers. A. Liechti 5040

5. Effects of Mechanical Stress, Temperature and Moisture.

Dielectric Constant of Carbon Disulphide at Low Temperatures. R. Guillien 2576
Dielectric Bolometer. P. Moon and L. R. Steinhardt 2859

6. Dielectric Loss.

Dielectric Properties of Solid Hydrochloric Acid. G. Hettner, E. Hettner and R. Pohlman 835
Theory of Absorption and Dispersion in Paramagnetic Crystals under Alternating Magnetic Fields. R. de L. Kronig 1292
Solid Friction in Dielectric Losses. A. Gemant 1296
H.F. Dielectric Loss of Liquids. P. Wulff and H. Schwindt 2577

For the **Key** to this Index see pp. 1182 to 1194.

Dielectrics and Capacitance, *continued.*

Abstract Nos.

Dielectric Absorption in Polar Media and the Local Field. R. H. Cole 3370
Dielectric Loss in Polar Materials. F. H. Müller 4657
Dispersion and Absorption of Polar Substances. P. Debye and W. Ramm.. 5041
Rôle of Solid Friction in Synthetic Dielectrics. A. Gemant 5042

7. Capacitance and its Measurements.

Measurement of Capacitance by Ballistic Methods. N. F. Astbury and L. H. Ford 1721
Calibration of Decade Condensers. L. H. Ford and N. F. Astbury 2109
Contact Capacity between Metals and Semiconductors. G. Dechêne 2137
Initial Charging Current in an Anomalous Dielectric. B. Gross............ 2578
Resistance and Capacity of Monofilms of Barium Stearate. C. E. Buchwald, D. M. Gallagher, C. P. Haskins, E. M. Thatcher and P. A. Zahl 2742
Semiconductor in an Alternating Current. G. Dechêne.................. 3357
Relative and True Power Factors of Air Capacitors. A. V. Astin 5022
Comparison of Capacities at Radio Frequencies. W. Vaughan 5043
Capacity of Mercury Electrode in Solutions of Capillary-Active Organic Substances. A. Ksenofontov, M. Proskurnin and A. Gorodetzkaja 5047
Capacity of the Solid Mercury Electrode. A. Gorodetzkaja and M. Proskurnin 5048

8. H.F. Measurements (*see also* Alternating Current Networks).

Dielectric Constants of Solutions of Amphoteric Electrolytes. Part III. H. Linhart 314
Dielectric Measurements on Hydrophilic Colloids. Part II. P. J. Denekamp and H. R. Kruyt 317
Current and Potential Measurements with Ultra-Short Waves. J. Malsch .. 367
H.F. Resistance of Cylindrical Conductors. E. P. Adams 825
Dielectric Measurements of Hydrophilic Colloids. Part III. H. R. Kruyt and J. T. G. Overbeek 833
Dielectric Properties of Solid Hydrochloric Acid. G. Hettner, E. Hettner and R. Pohlman 835
Electrostatic Problems Connected with Thick Cylindrical Shells. E. P. Adams 873
Effect of Residual Inductances in H.F. Capacitance Measurements. J. G. Miller 1297
Capacitance at Ultra-High Frequencies. R. King 1298
Determination of the Frequency of an Oscillator with a Condenser. H. Mukherjee 3871
Effect of Condenser Leads in Lecher Wire Measurements. H. Slätis........ 4620

10. Unclassified.

Electrostatic Activity Coefficients in Solvents of Medium Dielectric Constants. P. Gross, P. Kuzmany and M. Wald 853
Explanation of the Coehn-Raydt Law of Charge. A. J. Rutgers 875
Anomalous Charge and Discharge Currents in Dielectrics. E. Hippauf and R. Stein........................ 1722
Recent Developments in Electrical Insulating Materials. L. Hartshorn 3371
New Electrical Phenomenon. G. Piccardi 3822
Electrodynamic Volume and Porosity of Metallic Particles. H. Löwy 5044

Direct Reading Capacitance Meter. H. Bumann and J. Pfaffenberger...... 73B
Dielectric Losses in Inorganic Glasses at Radio Frequencies. N. Bogorodickiy and I. Friedberg 355B
Dielectric Properties of Insulating Materials. E. J. Murphy and S. O. Morgan 356B
Electric Breakdown of Solid and Liquid Insulators. A. v. Hippel.......... 729B
Dielectric Loss in Polar Liquids and Solids. S. O. Morgan................ 1503B
Physics of Dielectric Loss. P. O. Schupp 1505B
H.F. Thermal Breakdown of Solid Dielectrics. E. Gailish 1820B
Direct Measurement of H.F. Loss Conductance of Condenser. M. Boella .. 1844B
Method of Measuring Small Capacitances at Power Frequency. C. Pistoia.. 1845B
Attenuation Coefficients in Dielectric Cables. A. G. Clavier and V. Altovsky. 3333B

For the **Key** to this Index see pp. 1182 to 1194.

Diffusion and Osmosis.

1. Diffusion (General).
2. Osmosis.
3. Membrane Equilibria.
4. Porosity.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-Reference :
Electroosmosis, *see* Colloids.

1. Diffusion (General).

Abstract Nos.

Diffusion of Lithium Ions Through Quartz in an Electric Field. P. M. Harris and C. E. Waring 40
Attempt to Detect the Passage of Helium through a Crystal Lattice at High Temperatures. (Lord) Rayleigh 41
Experimental Development of Thermal Diffusion. T. L. Ibbs 42
Thermal Diffusion in Gas Mixtures. G. Blüh, O. Blüh and M. Puschner 43
Conductivity and Diffusion in the Semi-Metallic Alloys $Cu_{2-x}Se$. H. Reinhold, H. Möhring and H. Seidel 308
Dependence of Diffusion Coefficients on Concentration of Diffusing Metals. V. Bugakov and B. Sirotkin 440
Mutual Diffusion of Iron and Zinc. V. Bugakov 441
Search for Ionisation of Hydrogen by Diffusion through Palladium. R. G. Stansfield. 442
Diffusion and Vapour Pressure of Zinc in Brass. W. Seith and W. Krauss .. 795
Position Exchange in Metallic Phases. C. Wagner 944
Separation of Gaseous Isotopes by Diffusion. R. Sherr 2208
Diffusion and Viscosity in Binary Liquid Mixtures. H. Lemonde 2251
Dynamics of Certain Liquid Movements in Capillary Systems (Lloyd Effect). Wo. Ostwald and H. Erbring 2252
Diffusion Syphon. E. Manegold and K. Solf 2253
Process of Diffusion in a Centrifugal Field of Force. W. J. Archibald 2254
Diffusion of Cellulose Derivatives. A. Polson 2659
Perturbations in Crystal Lattices. J. Cichocki 2668
Solution of the General Problem of the Theory of Diffusion. B. Hostinský .. 2688
Temperature Variation of Diffusion Processes. H. S. Taylor 2689
Determination of Spontaneous Diffusion in Solid Hydrogen from the Reaction Course of the Ortho-Para Transformation. E. Cremer 2690
Sublimation and Diffusion of Salts and Metals. T. Peczalski 3324
Diffusion in Metals. P. Chevenard and A. Portevin 3492
Hydrogen Penetration through Mercury. J. Nikliborc 3493
Separation of Gaseous Mixtures by Diffusion. E. H. Riesenfeld and T. L. Chang 3494
Self-Diffusion in Solids. G. Hevesy 3495
Self-Diffusion Coefficient of Gold. H. A. C. McKay 3496
Process of Diffusion in a Centrifugal Field of Force. Part II. W. J. Archibald 3919
Diffusion of Electrolytes in Solution. K. Sitte and V. Daniel 3920
Gases and Metals. C. J. Smithells 3969
Diffusion of Water Enriched with H^2 and O^{17} through Dilute Gelatin Gel. N. Morita and T. Titani 4313
Diffusion of Non-Electrolytes in Organic Liquids. O. Lamm 4314
Diffusion of Water in Glycerin. O. Lamm and G. Sjöstedt 4315
Solution of the Fundamental Problems of Plane Theory of Elasticity in the Case of Contours with Corners. L. Magnaradze 4316
Diffusion of He and H_2 through Pyrex Glass. N. W. Taylor and W. Rast .. 4769
Interpretation of Diffusion Data for Strong Electrolytes. P. van Rysselberghe 4770
Diffusion of Water in Crystals. H. Kraft 4771
Porous Diaphragm Method of Measuring Diffusion Velocity, and Velocity of Diffusion of KCl in Water. G. S. Hartley and D. F. Runnicles 4772
Size of Paraffin-Chain Salt Micelles from Diffusion Measurements. G. S. Hartley and D. F. Runnicles 4773
Molecular Theory of Gases. Part II. M. Trautz 4994

2. Osmosis.

Osmotic Method for the Determination of Particle Weights in Colloidal Solutions. Wo. Ostwald 15
Explanation of the Coehn-Raydt Law of Charge. A. J. Rutgers 875
Osmotic Pressure, Heat and Entropy of Dilution in the Systems Nitrocellulose-Cyclohexanone and Nitrocellulose-Acetone. C. G. Boissonnas and K. H. Meyer 2691

Diffusion and Osmosis, *continued.*

Abstract Nos.

Osmosis. E. Ernst and J. Koczkás 3497

Activity and Osmotic Coefficients of Trivalent Metal Chlorides. C. M. Mason 3791

Variation of Osmotic Pressure, Heat of Dilution and Dilution Entropy of High-Molecular Solutions with Temperature. G. V. Schulz 3921

3. Membrane Equilibria.

Diffusion Processes in Living Systems. M. H. Jacobs 1803

Boundary Layer at Membrane and Monolayer Interfaces. J. H. Schulman and T. Teorell 4774

4. Porosity.

Adsorption and Surface Structure. J. H. de Boer and J. F. H. Custers 80

Transmission of Gases through Capillary Systems. E. Manegold 443

6. Unclassified.

Efflux of Gases through Orifices. B. V. Korvin-Kroukovsky. 460

Dilatation.

1. Expansion Coefficients:
   (*a*) Gases.
   (*b*) Liquids.
   (*c*) Solids.
2. Apparatus, *see* Supplementary Index.
3. Unclassified.

1. Expansion Coefficients.

(*a*) *Gases.*

Expansion of Vapours and Efficiency of Distillation. W. Świętosławski and E. Ramotowski 267

(*b*) *Liquids.*

Thermal Expansion and Conductivity in Liquid HeII. H. Jones 2503

Thermal Expansion of Liquids. J. Weichherz 3303

(*c*) *Solids.*

Thermal Expansion of Rh and of Al and Mg Alloys. H. Ebert 1240

Expansion of Glass with Tempering and Annealing. E. Rencker 1171

Allotropy of Neodymium. F. M. Jaeger, J. A. Bottema and E. Rosenbohm 1380

Thermal Expansion of Metals. E. Rosenbohm 2930

Thermal Expansion of Crystalline Sodium between 80° K. and 290° K. S. Siegel and S. L. Quimby 3304

Expansion of Crystals in Relation to their Structure. H. D. Megaw 4982

Dilatometric Anomalies in Cu-Al Alloys. A. Boutillier 4983

3. Unclassified.

Dilatometric Study of Colloidal Gels. A. Boutaric 1774

Low-Temperature Transformtion of ND$_4$Br. Part I. A. Smits, D. Tollenaar and F. A. Kröger 4309

Thermal Properties and Heats of Adsorption of Films on Vitreous Silica. W. G. Palmer 4354

Dynamical Problems (Astronomical).

Statistically Steady Distributions in Astronomy. H. Jeffreys 511

Motion of Nodes and Apsides in Planetary Systems. H. Fabre 512

Absolute Orbits of Planets. H. Fabre 513

Equilibrium of Stellar Clusters. H. Mineur 528

Calculation of the Term in the Motion of the Lunar Perigee with Characteristic e'^4. E. W. Brown 1019

Possibility of Expansion of a Slowly Rotating Spheroidal Mass of Incoherent Particles under Gravitational Forces. B. C. Mukerji 1027

Dynamics of Solar Prominences. K. O. Kiepenheuer 1067

Restricted Three-Body Problem. N. Rein 1504

Minor Planet Perturbations. E. Rabe 1512

Impossibility of Stratification of Liquid Rotating Stars. C. Mineo 1521

Dynamical Problems (Astronomical), *continued.*

Abstract Nos.

Differential Correction of the Orbit of a Visual Binary. W. H. van den Bos 1529

Orbital Elements of Visual Double Stars. A. Danjon 1530

Periodic Motion in Celestial Mechanics, and the Variation of Orbital Elements. H. Fabre 2753

Motion of the Apsidal Line in Close Binary Systems. Z. Kopal 2754

Ellipticity of Close Binaries. W. J. Luyten 2755

Periodic Solutions in the Restricted Problem of Three Bodies. T. Uno 3133

Periodic Motion in Celestial Mechanics, and the Variation of Orbital Elements. Part II. H. Fabre 3134

Wave Theory in Celestial Mechanics. P. Chadenson 3583

Restricted Three-Body Problem. N. Rein 3584

Problem of *n* Bodies. Y. Hagihara 3989

Equilibrium of Fluid Masses. R. Wavre 4383

Motion of Apsidal Line in Close Binary Systems. T. G. Cowling. 4835

Radiation of the Earth's Angular Momentum. T. Schlomka 4880

Elasticity and Plasticity.

1. Theory.
2. Elastic Coefficients.
3. Plasticity.
4. Photoelasticity.
5. Vibrations and Waves.
6. Strength and Failure Tests.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References :
Acoustic Vibrations, *see* Acoustics.
Elastic Properties of Colloids, *see* Colloids.
Piezoelectric Oscillations, *see* Piezoelectricity.
P.V.T. Relations, *see* Thermodynamics.
Seismic Effects, *see* Seismology.

1. Theory.

Maximum Error in the Application of Saint-Venant's Principle in an Isotropic Solid. O. Zanaboni 44

Torsion of Conical Shells. R. V. Southwell 45

Elasticity of Amorphous Bodies. P. Kobeko, E. Kuvshinskij and G. Gurevich 46

Frequencies and Nodal Systems of Circular Plates. R. C. Colwell and H. C. Hardy 444

Deflection of Thin Rectangular Plates Clamped at the Edges and Uniformly Loaded. B. C. Laws 445

Calculation of Maximum Deflection, Moment and Shear for Uniformly Loaded Rectangular Plate with Clamped Edges. I. A. Wojtaszak 446

Stability of a Clamped Elliptic Plate under Uniform Compression. S. Voinovsky-Krieger 447

Asymmetry of the Stress Tensor. S. Fujiwhara 452

Hydrodynamic Analogy for Shearing Stress Distribution in Bending. M. A. Biot 945

Relaxation Methods Applied to Engineering Problems. Part II. Basic Theory, with Applications to Surveying and to Electrical Networks, and an Extension to Gyrostatic Systems. A. N. Black and R. V. Southwell 946

Equilibrium of Thin Flat Membrane of Compressible Material. J. L. Synge 1415

Equilibrium of a Thin Plate, Symmetrically Loaded, Resting on an Elastic Foundation of Infinite Depth. A. H. A. Hogg 1416

Spiral Springs with a Small Number of Turns. R. P. Kroon and C. C. Davenport 1417

Subdivision of a Solid Body. L. Lecornu 1804

Modified Theory of Elasticity. W. E. Lilly 1805

Molecular Processes at the Elastic Limits. A. Smekal 1806

Applications of the Galerkin Method to the Torsion and Flexure of Cylinders and Prisms. W. J. Duncan 1807

Accurate Calculation of the Deflection of Beams and Struts. T. Pöschl 1808

Effect of Pressure upon the Elastic Parameters of Isotropic Solids, according to Murnaghan's Theory of Finite Strain. F. Birch 1809

Theory of Crystal Deformation. A. Pistocchi 2255

Equilibrium of Membranes. H. Pailloux 2692

New Forms of the Theorem of Three Moments. F. J. Turton 2693

Dynamical Model for Elastic and Plastic Strains in Stones. R. H. Evans 2790

Elasticity Equations of Domes of Rotation Deduced Elementarily. O. Zanaboni 3065

Elasticity and Plasticity, *continued.*

Abstract Nos.

Flexure and Shear with Associated Torsion in Prisms of Uniaxial and Asymmetric Cross-Section. A. C. Stevenson 3066
Equilibrium of Deformable Membranes. H. Pailloux 3067
Improved Calculation of the Energies of Metallic Li and Na. J. Bardeen 3068
Compressibilities of Alkali Metals. J. Bardeen 3069
Tension Experienced by an Ellipsoidal Balloon Envelope. L. Lecornu 3099
Atomic and Ionic Radii. Parts I and II. W. Hume-Rothery and G. V. Raynor. Part III. G. V. Raynor 3442
Parallel Plate Calculations. C. V. Brigatti 3498
Direct Determination of Stresses from Stress Equations. B. Sen 3499
Mechanics of Elastic Bodies. C. Cattaneo 3523
Mechanics of Elastic Collisions. Parts II and III. C. Cattaneo 4339
Finite Strain: Dislocation Solutions. S. T. Newing and W. M. Shepherd 4775
Relaxation Methods Applied to Engineering Problems. Part III. Problems Involving Two Independent Variables. D. G. Christopherson and R. V. Southwell 4776
Stresses in a Heavy Disc Suspended from an Eccentric Peg. R. D. Mindlin 4777
Relations between Energy Theorems Applicable in Structural Theory. D. Williams 4792

2. Elastic Coefficients.

Elastic Constants of Anisotropic Solids. H. A. Jahn 47
Modulus of Elasticity of Ferromagnetic Substances in Dependence on the Temperature and on the Magnetic Field. O. Engler 1338
Determination of Elastic Constants. F. Khol 1418
Elastic Properties of Metallic Wires at High Temperature. T. Fujiwara and T. Hukuda 1419
Velocity of Rebound and Energy Absorbed in Impact of a Hard Striker on a Soft Metal. L. Rebuffé 1462
Light-Scattering and Allied Properties of H_2O and D_2O. S. Bhagavantam and B. S. R. Rao 1609
Compressibilities of Fourteen Substances to 45,000 kg./cm^2. P. W. Bridgman 1798
Polymorphic Transitions up to 50,000 kg./cm^2 of Several Organic Substances. P. W. Bridgman 1799
Adiabatic Compressibility of Liquids. J. Villey 1810
Influence of Temperature and Pressure on the Volume and Refractive Index of Benzene. R. E. Gibson and J. F. Kincaid 1811
Supersonic Measurement of Elastic Constants of Solids. A. Walti 1813
Transmission of Compression Waves through a Solid Plate Immersed in a Fluid. H. Reissner 1814
Velocity of Sound in Single Crystals of Bismuth. A. B. Focke, R. B. Lindsay and C. R. Wilks 2100
Influence of Rate of Loading on Yield Point and Ultimate Stress. C. F. Elam 2256
Coefficient of Compressibility of Solids. P. Guareschi 2257
Electrical and Thermal Investigation on Manganin. Part II. A. Schulze 2563
Elastic Properties of Sodium Wires Between −183° and 90°C. R. H. V. M. Dawton 2694
Compressibility and Solvation of Solutions of Electrolytes. A. Passynski 2730
Transparency of Solid Plates to Supersonic Waves. E. Baumgardt 2958
Variation of Elastic Constants of Crystalline Sodium with Temperature Between 80° K. and 210° K. S. L. Quimby and S. Siegel 3500
Elastic Effect in Vulcanised Rubber. W. Braunbek 3501
Effect of Temperature on Elastic Modulus of Ferromagnetic Substances. W. Döring 3859
Elastic Constants of Transparent Isotropic Solids. K. H. Hoesch 3922
Temperature Dependence of Tension in Rubber. V. Haulk and W. Neumann 3923
Supersonic Measurement of Adiabatic Elasticity of Crystals. E. Baumgardt 4180
Sound Velocity in D_2O and its Compressibility. K. Yosioka 4184
Specific Heat-Temperature Curves of Age-Hardening Alloys. N. Swindells and C. Sykes 4576

3. Plasticity.

Rate of Viscous Flow of Metals. Part I. Tin. L. C. Tyte 950
Theory of Crystal Plasticity. A. Kochendörfer 1420

Elasticity and Plasticity, *continued.*

Abstract Nos.
Equilibrium of Plane Parallel Layers in Plastic Media at the Flow Limit. J. Mandel 1421
Theory of Plastic Deformation and Twinning. J. Frenkel and T. Kontorowa 1812
Atomic Foundation of Plasticity of Crystals. A. Kochendörfer 2695
Clay. W. H. Bragg 3169
Rates of Displacement in Viscous Bodies under Applied Stress. R. W. Douglas 3563
Theory of Plastic Buckling with its Application to Geophysics. P. P. Bijlaard 3604
Supermanent Deformations. J. Galibourg and P. Laurent 3924
Theory of Plastic Stability and its Application to Thin Plates of Structural Steel. P. P. Bijlaard 4317
Plastic Deformation of Pb, Cu and Al Under Static Compression. W. J. Lyons 4318
Rates of Displacement in Viscous Bodies under Applied Stress. R. W. Douglas 4829

4. Photoelasticity.

Birefringence Due to Compression of Quartz. G. Bruhat and A. Blanc-Lapierre 195
Distortion of the Photoelastic Fringe Pattern in an Optically Unbalanced Polariscope. R. D. Mindlin 448
Electrical Analogy as an Auxiliary Method of Photoelasticity. L. Malavard 947
Relation between Elastic and Optical After-Effects. H. Mussmann 1422
Photoelastic Determination of Stresses Around a Circular Inclusion in Rubber. W. E. Thibodeau and L. A. Wood 1815
Photoelastic Examination of Spatial Strain in Convergent Light. R. Hiltscher 2258
Photoelastic Analysis of Stress Concentration for Beams in Pure Bending with a Central Hole. J. J. Ryan and L. J. Fischer 2259
Determination of Elasto-Optical Constants with Supersonic Waves. H. Mueller 2960
Optical Method for the Determination of Variable Elastic Stresses. B. Ferretti 3502

5. Vibrations and Waves.

Periodic and Aperiodic Oscillations in Sensitive Regulators. H. König 449
Internal Friction in Solids. Part II. General Theory of Thermoelastic Internal Friction. C. Zener 504
Internal Friction in Solids. Part III. Experimental Demonstration of Thermoelastic Internal Friction. C. Zener, W. Otis and R. Nuckolls 505
Vibrations of a Rotating Rope. A. C. Stevenson 948
Vibrations of a Rotating Rope. C. E. Wright 949
Stresses Produced in Solids by Sound Waves. A. D. Fokker 1254
Velocity of Elastic Vibrations in Small Specimens. A. E. Ostrovskij 1423
Form Assumed by a Steadily Rotating Thread. H. W. Hall and W. Hunter 1424
Frequency of Longitudinal and Torsional Vibrations of Unloaded and Loaded Bars. R. M. Davies 1425
Matrix-Operational Methods in Mechanical Vibrations. L. A. Pipes 1450
Theory of Vibrograph. F. Gassmann 1562
Internal Friction in Solids. Part IV. Relation between Cold Work and Internal Friction. C. Zener 1881
Reflection of Plane Wave Pulses from Plane Parallel Plates. M. Muskat 2013
Asymptotic Formulae Relating to Relaxation Oscillations. J. Haag 2260
Characteristic Oscillations of Spherical Shells. Part II. K. Federhofer 2696
Non-Homogeneous Strings with Parabolic Density Distribution. A. Erdélyi 2697
Rearrangement of Characteristic Frequencies and Damping in Coupled Oscillations. K. W. Wagner 2698
Forced Vibrations of a Holonomous System with Two Degrees of Freedom. A. Nadile 3070
Internal Friction in Solids. Part V. General Theory of Macroscopic Eddy Currents. C. Zener 3127
Operational Treatment of Nonlinear Dynamical Systems. L. A. Pipes 3326
Vibration of a Bar Bent along a Circular Arc. T. Ikebe 3925
Eigenwert Problems for the Rectangular Elastic Plate. S. Iguchi 4319
Dunkerley's Frequency Formula. E. Jouguet 4602
Fluctuations of an Auto-Oscillating System. I. Berstein 4723

Elasticity and Plasticity, *continued.*

6. Strength and Failure Tests.

Abstract Nos.
Effect of a Groove on the Strength of Rock-Salt. Part II. A. W. Stepanow. 435
Structure of Steel at Fracture. H. J. Gough and W. A. Wood 1816
Strain in Glass. Part II. N. Winter-Klein 2261
X-Ray Investigation of Failure of Metals. H. J. Gough and W. A. Wood 3071
Rupture. P. W. Bridgman 3926
Fracture of Glass Plates by Percussion. T. Okaya and K. Ishiguro 4320
Self-Hardening as a Method for Increasing Strength of Glass. I. I. Kitaigorodsky 4321
Standard Discs in Strain Testing of Glassware. E. J. Gooding 4778
Dependence of Mechanical Strength of Quartz Glass on Temperature. W. Dawihl and W. Rix 4779
Influence of Elastic Anisotropy on X-Ray Measurement of Strain. R. Glocker 4974

8. Unclassified.

X-Ray Study of Stretched Rubber. H. A. Morss, Jr. 1391
Heat Produced by the Internal Deformation of a Block of Lead Influenced by its Own Weight. W. Świętosławski, L. Keffler and J. Salcewicz 2498
Elastic After-Effect. Part II. Schlötzer 3503
Mechanical and Thermal Treatment of Synthetic Resins. S. Erk and W. Holzmüller 3504

Recent Research in Elasticity. J. N. Goodier 328B
Recent Investigations in Plastic Torsion. C. W. MacGregor and J. A. Hrones 329B
Electrochemical Study of Deformation of Metals. L. V. Nikitin 351B
Bending of Beams on Elastic Foundations. R. T. Coe 484B
Stress Strain Curve for Polycrystalline Metals. R. K. Haskell 1113B
Deformation and Fracture of Metals. H. J. Gough and W. A. Wood 1475B
Determination of Principal Stresses from Photoelastic Data. M. M. Frocht 1476B
Photoelastic Materials. G. H. Lee and C. W. Armstrong 1515B
Internal Shearing Stress in Cold-Twisted Metallic Bars. T. Uéda 2584B
Photoelastic Analysis. O. J. Horger 2588B
Phenolformaldehyde as Photoelastic Material. A. Kuske 2589B
Damping of Forced Oscillations. E. Lehr and A. Weigand 3620B

Electrochemistry.

1. Primary and Secondary Cells.
2. Concentration Cells.
3. Electrolysis.
4. Ionic Mobilities and Transport Numbers.
5. Electrode Potentials and Electrode Phenomena.
6. Apparatus, *see* Supplementary Index.
7. Unclassified.

Cross-References :
Becquerel Effect, *see* Photoelectricity.

Cross-References (contd.) :
Conductivity of Electolytes, *see* Conduction (Electric) in Solids and Liquids.
Electrocapillary Phenomena, *see* Surface Properties.
Electrokinetic Phenomena, *see* Colloids.
Photovoltaic Cells, *see* Photoelectricity.
Theories of Solution, *see* Solution.
Thermodynamics of Cells, *see* Thermodynamics.

1. Primary and Secondary Cells.

Fundamental Properties of the Ideal Cell. E. Lange and K. Nagel 320
E.M.F. of Non-Isothermal HCl Galvanic Cells. Z. Szabó 838
E.M.F. of Copper-Cupric Salt-Platinum Cells. S. Veil 1299
Light High-Potential Battery. W. E. Ramsey 2579
Electrolytic Thermo-Cells. J. J. Hermans 2988
Ag-Ni and Ag-Pt Contacts in Aqueous KI. S. Veil 3372
Reactions at the Positive Electrode of the Lead Accumulator. V. Sinn 3373
Galvanic Cells with Formation of Alloys. V. A. Plotnikov and D. P. Zosimovich 4658

2. Concentration Cells.

Helmholtz and Nernst. W. D. Bancroft 3374

Electrochemistry, *continued.*

3. Electrolysis.

	Abstract Nos.
Electrolysis of Molten Salts. P. Drossbach	839
Electrolytes and Electrolysis. R. W. Gurney	1300
Van der Waals Forces and the Debye-Hückel Theory of Strong Electrolytes. S. Oka	1685
Van der Waals Forces in Electrolytes. J. Lange and E. Herre	1686
Electrolysis of Metallic Perchlorates in Cellosolve. J. L. Beal and C. A. Mann	1723
Electrolytic Separation of Deuterium ; Influence of Temperature and Current Density at Various Kathode Metals. H. F. Walton and J. H. Wolfenden	1724
Radius of Copper Ion in Solutions of Cupric Benzenesulphonate. M. Quintin	2144
Electrolysis of Colloidal Silver Solutions. M. Centnerszwer and J. Borowicz	2231
Electrodeposition of Copper in Presence of Iron Salts. M. Geloso and P. Deschamps	2580
Electrolysis of Solutions of Protactinium. H. Emmanuel-Zavizziano and M. Haïssinsky	2581
Electrolysis of Molten Salts. P. Drossbach	2582
Structure of Electrolytic Deposits. P. Jacquet	2737
Electrolytic Water-Transport and Ionic Hydration Numbers. H. C. Hepburn	2989
Decomposition Voltage of Fused Magnesium Chloride. K. Sano	3375
Fractionation of Li and K Isotopes by Chemical Exchange with Zeolites. T. I. Taylor and H. C. Urey	3439
Densities of D_2O and H_2O : Electrolytic Separation of Oxygen Isotopes. L. Tronstad and J. Brun	3489
Activity and Osmotic Coefficients of Trivalent Metal Chlorides. C. M. Mason	3791
Glow-Discharge Electrolysis. Part VII. A. Klemenc and H. Kalisch	3823
Glow-Discharge Electrolysis. Part VIII. A. Klemenc and H. Milleret	3824
Diffusion of Electrolytes in Solution. K. Sitte and V. Daniel	3920
Activity Coefficient of $CoCl_2$ in Aqueous Solution. R. A. Robinson	4178
Active Aluminium Obtained by Electrolysis at Elevated Temperature. A. Chrétien and J. Bisch	4214
Electrolytic Dissociation of Cadmium Iodide. Y. Doucet	4215
Exchange Forces and Electrostatic Forces between Ions in Solution. R. W. Gurney	4216
Electrostatic Influence of Substituents on Dissociation Constants of Organic Acids. Parts I and II. J. G. Kirkwood and F. H. Westheimer	4217
Structure of Electrolytic Lead Deposited from Nitrate Solutions. S. Yamamori and S. Yoshimoto	4296
Structure of Electrolytically Polished Copper Surfaces. K. H. Moore	4363
Preparation of NaOH and H_2SO_4 by Electrolysis of Na_2SO_4. G. Grube and S. Stainoff	4659
Calculation of the Ionisation Constants of Inorganic Oxygen Acids from their Structures. A. Kossiakoff and D. Harker	4660
Observation of Diffusion Layer in Electrodeposition. H. J. Antweiler	4661

4. Ionic Mobilities and Transport Numbers.

Mobilities of Ions in Liquid Hydrocarbons and their Relation to the Coefficient of Viscosity. M. I. Adamczewski	321
Mobility of Ions in Very Viscous Liquid Dielectrics. J. Świętosławska-Ścisłowska and I. Adamczewski	2990
Mobility of Ions and Temperature in Liquid Dielectrics. I. Adamczewski	2991
Transference Numbers of Potassium Acetate in Aqueous Solution. D. J. le Roy and A. R. Gordon	3376
Energies of Disorder in Ionic Crystals. W. Jost	3461
Movement of Ions and Electrons in Solids and the Interpretation of Reactions between Solids. C. Wagner	3825
Excitation of Radiating Atoms in a Gas Discharge. V. Fabrikant	4199
Coupling of Ionic Transference in the Case of Multiple Electrodes. K. Nagel	4662
Electrolytic Migration Velocity in Metallic Solutions. K. Schwarz	4663
Interpretation of Diffusion Data for Strong Electrolytes. P. van Rysselberghe	4770
Carrier Mobility Spectra of Liquids Electrified by Bubbling and Spraying. S. Chapman	4827
Transport Numbers of Paraffin-Chain Salts in Aqueous Solution. Parts II and III. C. S. Samis and G. S. Hartley	5045

For the **Key** to this Index see pp. 1182 to 1194.

Electrochemistry, *continued.*

5. Electrode Potentials and Electrode Phenomena.

Abstract Nos.
Electrolytic Overvoltage. M. Lemarchands and W. Juda ... 322
Electrochemical Investigations of Solid Metallic Alloys. A. Ölander ... 323
E.M.F.s between Glass and Salts in Melts. B. v. Lengyel and A. Sammt ... 324
Theory of the Glass Electrode. Part I. B. P. Nicolsky ... 325
Asymmetric Potential of the Glass Electrode. H. Yoshimura ... 326
Temperature Coefficient of the Standard Silver Electrode. Entropy of Silver Ion. J. J. Lingane and W. D. Larson ... 327
Molal Ferric-Ferrous Electrode Potential. W. C. Schumb, M. S. Sherrill and S. B. Sweetser ... 328
Electrode Polarisation. Part I. Accurate Measurement of Potential of Polarised Electrode. A. Hickling ... 329
Copper Oxide Films. H. A. Miley ... 497
Potentials of Silver and Other Metals in Solutions of Halogen Salts. I. P. Morkovko and E. W. Zmačinskij ... 840
Theory of Potential Jump at Metal Surfaces in Solutions of Other Ions. I. P. Morkovko and E. W. Zmačinskij ... 841
Periodic Reaction in the H_2-Cl_2 Electrode. K. Biastoch ... 842
Electrometric Behaviour of Palladium Hydride. P. Nylén ... 843
New Electrode for pH Measurements. P. Nylén ... 844
Potential of the Normal and the Decinormal Calomel Electrodes. H. T. S. Britton and G. Welford ... 845
Standardisation of Buffer Solutions at Elevated Temperatures. H. T. S. Britton and G. Welford ... 846
Glass Electrode Measurement of pH of Slightly Buffered and Unbuffered Solutions. E. G. Edwards and D. P. Evans ... 847
Temperature Compensation in pH and Conductivity Measurements. F. Lieneweg ... 848
Theory of Hydrogen Overvoltage. A. Frumkin ... 849
Hydrogen Overvoltage and ζ-Potential Part II. S. Lewina and W. Sarinsky 850
Action of Points in Electrolytic Valve Anodes. A. Güntherschulze and H. Betz 851
Passivity of Chromium. E. Müller ... 852
Solubility and Activity Coefficient of $AgIO_3$ in KNO_3 Solutions. Standard Potential of Ag-$AgIO_3$ Electrode. I. M. Kolthoff and J. J. Lingane ... 985
Effect of Cobalt Salts on Anodic Behaviour of Lead in a Sulphate-Containing Electrolyte. M. Rey, H. Herbiet and P. Coheur ... 1301
Potential of Silver-Silver Ferrocyanide Electrode at 25°. J. N. Pearce and L. D. Ough ... 1302
Adsorption at the Mercury Drop Electrode and Maxima of the Polarographic Current-Voltage Curves. A. Winkel and H. Siebert ... 1303
Application of Halide Reference Half-Cells to pH Determinations. W. J. Hamer ... 1725
Standard Potential of the Silver-Silver Azide Electrode. A. C. Taylor and L. F. Nims ... 1726
Palladium Kathode in Chromic Acid Solutions. E. Müller ... 1727
Mechanism of Hydrogen Overvoltage. S. v. Náray-Szabó ... 1728
Overvoltage. A. L. Ferguson and S. Kleinheksel ... 2145
Mechanism of Overvoltage. M. Loschkarev and O. Essin ... 2146
Mechanism of the Hydrogen Electrode Process. Parts I and II. J. Horiuti, G. Okamoto and K. Hirota ... 2147
Glass Electrode for pH Measurements with Small Amounts of Solution. Y. Kauko and L. Knappsberg ... 2148
"Normal Potential" of Deuterium. E. Avel and O. Redlich ... 2149
Activity Coefficient and Mean Ionic Diameter in Solutions of Mixed Electrolytes. H. I. Stonehill ... 2150
Potential of Cadmium in Cadmium Benzene-Sulphonate. M. Quintin ... 2583
Lanthanum Amalgam Electrode for Precise E. M. F. Measurements. W. G. Parks and R. W. Kingerley ... 2584
Potentials of Pt Electrodes in Photographic Developers. A. E. Cameron ... 2585
Electrochemical Behaviour of Rhodium. Part V. G. Grube and H. Autenrieth ... 2586
Normal Potential of Deuterium and the Ionic Equilibrium in Mixtures of H_2O and D_2O. G. Schwarzenbach ... 2587
Overvoltage and Mechanism of Electrolytic Hydrogen Evolution. K. Wirtz 2588

For the **Key** to this Index see pp. 1182 to 1194.

Electrochemistry, *continued.*

Abstract Nos.

E.M.F. of Saturated Weston Standard Cells Containing D_2O. L. H. Brickwedde and G. W. Vinal 2589
Flow Potentials, Electro-Endosmosis and Electrophoresis with Platinum. H. R. Kruyt and J. Oosterman 2661
Electrochemistry of the Rusting Process along a Scratch-Line on Iron. R. S. Thornhill and U. R. Evans 2992
Meaning and Standardisation of the pH Scale. D. A. MacInnes, D. Belcher and T. Shedlovsky 2993
Reproducibility of Ag-AgCl Electrode. E. R. Smith and J. K. Taylor 2994
Normal Potential of Cadmium and Radius of the Cadmium Ion in Solutions of the Benzenesulphonate. M. Quintin 3377
Variation of Polarisation of a Nickel Anode with Time in the Electrolysis of Water in Alkaline Solutions. G. Grube and A. Vogt. 3378
Adsorption at the Mercury Drop Electrode and the Polarographic Current-Voltage Curves. A. Winkle and H. Siebert 3379
Interpretation of Activity Measurements. C. W. Davies 3380
Kathode-Ray Oscillographic Study of Anodic Passivation of Gold in Chloride Solutions. J. D. Pearson and J. A. V. Butler 3381
Polished Electrodes and the Beilby Layer-Electrolyte Passage Zone. F. J. Taboury 3826
Polished Electrode for Differential Titrations. M. Paić 3827
Anodic Oxidation of Acid-Ester Salts. A. Hickling and J. V. Westwood 3828
Normal Volta Potentials $\Delta\psi_0$ of Two-Phase Systems. O. Klein and E. Lange 3829
Potentiometric and Magnetometric Study of the Duroquinone System. L. Michaelis, M. P. Schubert, R. K. Reber, J. A. Kuck and S. Granick 3852
Effect of Ultrasonic Vibrations on the Discharge Potential of Hydrogen. R. Piontelli 4179
Influence of Degree of Ionisation on Structure of Beilby Layer. Electrolyte Passage. F. J. Taboury 4218
Effects of Solvents on Polarographic Wave Heights. E. S. Peracchio and V. W. Meloche 4219
Adsorption and Desorption of Hydrogen at Platinum Electrodes. J. D. Pearson and J. A. V. Butler 4220
Potential of Cd/Cd^{++} in Very Dilute Solutions. F. Müller and W. Dürichen 4221
Flow Phenomena at Mercury Kathodes. M. v. Stackelberg, H. J. Antweiler and L. Kieselbach 4222
Elimination of Liquid Junction Potentials. Part I. B. B. Owen. Part II. B. B. Owen and S. R. Brinkley, Jr. 4664
Reactions with Commutated D.C. at a Graphite Electrode. V. Sihvonen 4665
New Polarograph and Applications. A. Schmidt 4666
Potential of Pt in Solutions of Ag Salts. A. Obrutschewa 4667
Glass Electrode in Alkaline Solutions. D. O. Jordan 5046
Capacity of Mercury Electrode in Solutions of Capillary-Active Organic Substances. A. Ksenofontov, M. Proskurnin and A. Gorodetzkaja 5047
Capacity of the Solid Mercury Electrode A. Gorodetzkaja and M. Proskurnin 5048

7. Unclassified.

Strength of Strong Mineral Acids. H. v. Halban and M. Seiler 330
Electrostatic Activity Coefficients in Solvents of Medium Dielectric Constant. P. Gross, P. Kuzmany and M. Wald 853
Electrophoresis of Hydrocarbons and Simple Derivatives as a Function of pH. J. C. Carruthers 921
Theory of Schiller Layers. P. Bergmann, P. Löw-Beer and H. Zocher 1304
Base Strengths and Absorption Spectra of *p*-Methyl- and *p*-Bromo-acetophenone. L. A. Flexser and L. P. Hammett 2465
Growth of Metal Trees in Gels. A. King and N. Stuart 2995
Mixtures of Ampholytes. A. Boutaric 3104
Electrochemical Interpretation of Wagner's Theory of Tarnishing Reactions T. P. Hoar and L. E. Price 3830
Electrochemistry of Congo-Dye Sols. W. Pauli and P. Szarvas 3899
Streaming Potentials and Surface Conductivity. A. J. Rutgers, E. Verlende and M. Moorkens 4636

Current Density at Kathode and Structure of Electrolytic Metal Deposits. A. T. Wahramian 349B

Electrochemistry, *continued.*

Abstract Nos.
Electrolytic Polishing of Aluminium. P. Jacquet 350B
Electrochemical Study of Deformation of Metals. L. V. Nikitin 351B
Orientation of Crystallites in Electrolytic Cu. V. Montoro 1491B
Solution of Rh by A. C. Electrolysis. E. Raub and G. Buss 2109B
Optical Study of Negative Plate of Planté Accumulator in Operation. G. Valenti 2595B

Electro-Optical and Magneto-Optical Effects.

1. Double Refraction in Electric or Magnetic Fields.
2. Magnetic Rotation of Plane of Polarisation.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References :
Photophoresis, *see* Emission (Radiation).
Stark Effect, *see* Spectroscopy.
Zeeman Effect, *see* Spectroscopy.

1. Double Refraction in Electric or Magnetic Fields.

Electric Double Refraction of Liquefied Gases. G. Guillien 624
Temperature Variation of Magnetic Double Refraction in Acetone and Acetic Esters. J. B. Hawkes 625
Improved Spectroradiometric Method and Apparatus for Measuring Small Polarisation Ellipticities. L. R. Ingersoll 674
Isothermal and Reversible Immobilisation of Particles in Thixotropic Sols. W. Heller and G. Quimfe 914
Effect of Orientation of Non-Spherical Colloidal Particles on their Velocity of Aggregation. W. Heller and G. Quimfe 915
Classical Optics. E. Buchwald 1170
Magnetic Birefringence of Solutions of Pinenes in Benzene. J. Rabinovitch .. 1586
Magnetic Birefringence of Aromatic Compounds in the Molten State. W. J. John 1587
Magnetic Double Refraction of Organic Liquids and their Vapours. H. König 1588
Electric Kerr Effect in Liquid and Gaseous CO_2. L. H. Borchert 1589
Thermal Variation of the Cotton-Mouton Constant for Liquid Aromatic Hydrocarbons. C. F. Squire 1970
Application of Quartz Crystals to the Modulation of Light. D. W. R. McKinley 2841
Absolute Measurement of Kerr Constants with Alternating Potential. Y. Björnståhl 4072
Electric and Magnetic Birefringence of Liquids. A. Goldet 4468
Anomalous Dispersion and Free Rotation. A. Budó 5037

2. Magnetic Rotation of Plane of Polarisation.

Faraday Effect of Strong Electrolytes in Aqueous Solutions. Part VI. A. Okazaki 626
Ultra-Violet Absorption Bands of Ethyl Alcohol, *n*-Propyl Alcohol, and *n*-Butyl Alcohol in Relation to Magneto-Optical Dispersion. W. G. J. Beynon 1590
Ultra-Violet Absorption Bands of Methyl Alcohol and Allyl Alcohol and their Relation to Magneto-Optical Dispersion. W. J. G. Beynon and E. J. Evans 1591
Light Vibrations in a Medium in an Alternating Magnetic Field. G. Zanotelli 1971
Paramagnetic Rotatory Power of Hydrated Ethyl Sulphate of Nd in the Direction of the Optic Axis. J. Becquerel, W. J. de Haas and J. van den Handel 4073
Magneto-Optical Activity of Crystalline $NiSO_4$, α-$6H_2O$. F. G. Slack, R. T. Lageman and N. Underwood 4074
Magnetic Rotatory Power of HF. R. de Mallemann and F. Suhner 4469
Magneto-Optic Rotations of Paramagnetic Ions. S. Steingiser and H. Hyman 4905

4. Unclassified.

Two Possible Orientations of Colloidal Goethite in the Magnetic Field. W. Heller and G. Quimfe 924
Effect of Magnetic Field on the Absorption of Se_2. S. Rouppert 1201
Effect of Magnetic Field upon Mercury Discharge Radiation. V. Fabrikant and G. Rokhlin 4075

Electrons, Neutrons, Positrons and Protons.

1. Constitution.
2. Magnitudes (Charge, Mass, Magnetic Moments, etc.).
3. Collision: Diffraction, Scattering, Reflection, Absorption, Polarisation, Secondary Emission.
4. Diffusion.
5. Electron Optics.
6. Kathode-Ray Oscillographs, Applications of.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References:
Conduction of Electricity in Metals, *see* Conduction (Electric) in Solids and Liquids.
Structure Determination by Electron Diffraction, *see* Atomic and Molecular Structure; Crystal Structure, etc.; *and* Surface Properties.
See also Atomic and Molecular Structure, *also* Radioactivity.

1. Constitution.

Abstract Nos.
Symmetry between Particles and Anti-Particles. G. Racah 331
Eigen-Time in Classical and Quantum Mechanics. V. Fock 472
Use of Charge-Conjugated Wave Functions in the Hole Theory of the Electron. H. A. Kramers 971
The Electron and Limits to the Precision of Electromagnetic Field Specifications. W. H. Watson 1740
Ring Structure of the Electron. B. S. M. Rao 2151
Theory of Elementary Particles. G. Wataghin 2283
Notion of Corpuscle. Application to Heavy Electrons. J. L. Destouches 2590
Heavy Electrons and Theories of Nuclear Phenomena. G. Wentzel 2647
Theory of the Neutral Particle. W. H. Furry 3532
Axiality of Emission of Light from the Hydrogen Atom in an Electric Field. J. Stark, R. Ritschl and H. Verleger 3735
Light Emission and Ionisation of States of Motion of the Hydrogen Atom in Strong Electric Fields. J. Stark and R. Ritschl 3736
Production of Heavy Electrons. L. W. Nordheim and G. Nordheim 3831
Cosmic Rays and Nuclear Forces. I. Tamm 4078
Heavy Electrons in Cosmic Rays. V. Veksler and N. Dobrotin 4079
Structure of Matter. Part I. G. Fournier 4270
Multiple Structure of the Electron. U. Kakinuma 4668
Definition of the Neutrino. J. Solomon 4906

2. Magnitudes (Charge, Mass, Magnetic Moments, etc.).

Ratio of Masses of Fundamental Particles. H. T. Flint 332
Charge of the Electron. H. R. Robinson 1305
Spin Angular Momentum of the Electron. U. Kakinuma 1729
Non-Relativistic Theory of Particles with Integral Spin. A. Proca 1972
X-Particle. A. Bramley 1975
Fundamental Unit of Electric Charge. H. T. Flint and W. Wilson 2152
Improved Method for the Determination of the Specific Charge of β-Particles; Specific Charge of Disintegration Electrons from RaE. C. T. Zahn and A. H. Spees 2591
Critical Analysis of the Classical Experiments on the Relativistic Variation of Electron Mass. C. T. Zahn and A. H. Spees 2592
Heavy Electron. J. L. Destouches 2593
Energy-Range Relations for Deuterons, Protons and α-Particles. F. T. Rogers, Jr., and M. M. Rogers 2594
Experiments on Magnetic Properties of Free Neutrons. O. R. Frisch, H. v. Halban, Jr. and J. Koch 2595
Collective Electron Energy and Specific Heat. E. C. Stoner 2948
Proper Energy of the Electron. A. Mercier and T. Gustafson 2996
Most Probable Value of the Electronic Charge and Other Related Constants for 1938. R. A. Millikan 2997
Paramagnetic Conversion of Parahydrogen and Orthodeuterium in the Presence of Nitric Oxide and the Magnetic Moment of the Deuteron. L. Farkas and U. Garbatski 3024
Most Probable Value of the Electronic Charge and other Related Constants for 1938. R. A. Millikan 3832
Dimensionless Constants of Physics. A. E. Haas 3956
Absolute Wave-Length of $K\alpha_{1,2}$ Line of Al. F. Tyrén 4161
Influence of the Ramsauer Effect on the Potential Gradient in a Positive Column. B. Klarfeld 4196

Electrons, Neutrons, Positrons and Protons, *continued.*

Abstract Nos.

New Precision Method for the Determination of e/m for Electrons. A. E. Shaw 4223
Viscosity of Air. V. D. Majumdar and M. B. Vajifdar 4376
Mass of the Neutron. G. Stetter and W. Jentschke 4669
Determination of e/m from the Hα -Dα Interval. R. C. Williams 5049
Determination of e/m from Refraction of X-Rays in a Diamond Prism. J. A. Bearden 5050

3. Collision: Diffraction, Scattering, Reflection, Absorption, Polarisation, Secondary Emission.

Theory of Motion of Electrons in Gases and Semiconductors. B. Davydov 287
Scattering of Helium Canal Rays by Helium Nuclei. C. Gerthsen 295
Angular Distribution of Pairs Produced in Pb by Penetrating or Hard γ-Radiation. H. Adam, G. Burkhardt 333
Angular Distribution of Protons Projected by Fast Neutrons. P. I. Dee and C. W. Gilbert 334
Range and Angle of Projection for Protons in Photo-Distintegration of Deuterium. J. Chadwick, N. Feather and E. Bretscher 335
Nature of Interaction between Neutron and Proton from Scattering Experiments. H. S. W. Massey and R. A. Buckingham 336
Scattering and Absorption Cross-Section of Neutrons in Cobalt. N. E. Bradbury, F. Bloch, H. Tatel and P. A. Ross 337
Energy Losses of Fast Electrons. L. J. Laslett and D. G. Hurst 338
Diffraction of β-Rays. S. C. Curran 339
Theory of Elastic Scattering of a Beam of Particles by Atoms. K. C. Kar, M. Ghosh and K. K. Mukherjee 340
Elastic Scattering by Hydrogen and Helium. K. C. Kar 341
Shot Effect of Secondary Electrons from Nickel and Beryllium. B. Kurrelmeyer and L. J. Hayner 382
Recent Results of Experimental Nuclear Investigations. R. Fleischmann 388
Method of Measuring the Internal Periodic Potential of Crystals. A. Hautot 417
Collisions of α-Particles with Neon and Deuterium Nuclei. J. T. McCarthy .. 608
Range of H-Rays by the Photographic Method. M. Blau and H. Wambacher 618
Collision of a High Energy Neutrino with a Neutron. S. Tomonaga and H. Tamaki 630
Liberation of Electrons by Positive Ions Rebounding from an MgO Kathode in the Anomalous Glow Discharge. A. Güntherschulze and W. Bär 817
Stern-Gerlach Experiment with Electrons. F. Adler 854
Passage of Very Fast Protons through Matter. M. Drăganu 855
Passage of Slow Electrons through Metal Foils. H. Katz 856
Scattering of Kathode Rays by Metal Foils. E. Kruppke 857
Properties of an Electron Beam of Homogeneous Velocity after Transmission through a Thin Foil. F. Kirchner 858
Liberation of Secondary Electrons from Adsorbed Layers. O. Krenzien 859
Secondary Electron Emission. Part I. Metals. H. Bruining and J. H. de Boer 860
Collision of Proton and Deuteron. K. Ochiai 861
Neutron Resonance Levels for Ir and Rh and Comparison of Yields. R. Jaeckel 862
Angular Scattering of Neutrons by Protons. E. Philipp 863
Absorption of Group C Neutrons in Ag, Cd and B at Different Temperatures. F. G. Houtermans, A. I. Leipunsky and L. Rusinov 864
Neutron Absorption Limit in Cadmium. J. G. Hoffman and M. S. Livingston 865
Multiple Scattering of Neutrons. Part I. Theory of the Albedo of a Plane Boundary. O. Helpern, R. Lueneburg and O. Clark 866
Scattering of Fast β-Particles in Nitrogen. Part I. E. G. Stepanowa 1124
Interaction of Elementary Particles. Part II. H. Yukawa and S. Sakata 1306
Probability of Collisions of the Second Kind between Atoms and Free Electrons. V. Fabrikant 1307
New Method of Investigating Atomic Electron Velocities. A. L. Hughes and M. M. Mann, Jr. 1308
Electron Diffraction Bands. H. Boersch 1309
Anomalous Scattering of Fast Electrons. D. Masurenko 1310
Scattering of Protons by Protons. L. R. Hafstad, N. P. Heydenburg and M. A. Tuve 1311

For the **Key** to this Index see pp. 1182 to 1194.

Electrons, Neutrons, Positrons and Protons, *continued.*

Abstract Nos.
Absorption of C-Neutrons in Ag, Cd and B at Different Temperatures. A. I. Leipunsky and L. Rusinov 1312
Slow Neutrons. P. B. Moon 1313
Production of γ-Rays by Neutrons. E. H. S. Burhop, R. D. Hill and A. A. Townsend 1583
Influence of Adsorbed Gases on Secondary Electron Emission from Metals. P. Colombino 2153
Energy Loss of Fast Charged Particles by Pair Creation. M. Kobayasi and S. Ozaki 2154
Energy Absorption from Fast Kathode Rays. K. Gentner 2155
Absorption of High Energy Electrons. Part III. A. J. Ruhlig and H. R. Crane 2156
Absorption of Slow Neutrons in B and Li and the $1/v$ Law. F. Norling and R. Fleischmann 2157
Collisions of Fast Neutrons with Protons. T. Kahan 2158
Scattering of Slow Neutrons in a Crystal Lattice. I. Pomerantschuk 2159
Fast Neutrons. M. L. Pool 2391
Cross-Sections for Reactions between Very Light Nuclei. S. Flügge 2394
Cascade Theory of Electronic Showers. L. Landau and G. Rumer 2424
Heating of a Crystal by the Kossel Effect. M. v. Laue 2488
Scattering and Dissociation of Slow Ions. F. Wolf 2548
Nuclear Collisions. L. Goldstein 2596
Multiple Scattering of Electrons. H. A. Bethe, M. E. Rose and L. P. Smith 2597
Properties of a Homogeneous Electron Beam after Transmission through a Thin Foil. J. J. Trillat and A. Hautot 2598
Theory of Electron Diffraction and the Kikuchi Envelope. E. Lamla 2599
Creation of Electron Pairs by Nuclear Capture of Neutrons. H. S. W. Massey 2600
Diffusion of Neutrons of Uniform Speed through Protons. B. Pontecorvo 2601
Energy and Intensity of Photoneutrons from Beryllium and from Deuterons. H. v. Halban, Jr. 2602
Slow Neutrons Transmitted by Cadmium. C. H. Westcott and L. Sosnowski 2603
Dependence of the Coefficient of Secondary Emission on Angle of Incidence of the Primary Beam. S. J. Lukjanov 2604
Application of " Reciprocity " to Nuclei. M. Born 2649
Detection of Cosmic Rays and Neutrons by Photographic Plates. M. Blau and H. Wambacher 2848
Direct Photographic Detection of Heavy Particles in Cosmic Radiation. M. Blau and H. Wambacher 2849
Showers Produced by Cosmic Radiation. W. Heitler 2857
Effect of Positive Ion Bombardment on the Emission of Electrons from the Kathode in the Glow Discharge. Part II. A. Güntherschulze and H. Betz 2968
Effect of Positive Ion Bombardment on the Electron Current from the Kathode in the Glow Discharge. Part III. A. Güntherschulze and W. Bär 2969
Production of Very High Energy Electrons. K. Schwarz and F. Ebster 2998
Passage of Very High Energy Particles through Atomic Nuclei. W. Heisenberg 2999
Interaction of Elementary Particles. Part III. H. Yukawa, S. Sakata and M. Taketani 3000
Inner Potentials of Graphite and Molybdenite. R. Uyeda 3001
Theory of Electron Diffraction. J. Farineau 3002
Electron Diffraction and the Kikuchi Envelope. Part II. E. Lamla 3003
Formation of Positron-Electron Pairs. K. Zuber 3004
Secondary Electron Emission from Complex Kathodes of Rb and K. P. Timofeev and A. Pjatnizki 3005
Secondary Emission of Thin Films of Alkali Metals upon Au, Ag and Pt Substrates. A. Afanasjeva and P. Timofeev 3006
Elastic and Inelastic Scattering of Fast Neutrons. D. C. Grahame and G. T. Seaborg 3007
Absorption of Slow Neutrons in Dysprosium and Cadmium. J. J. Gurevich and M. G. Meščerjakov 3008
Energy Loss of Elementary Particles with Integer Spin. E. C. G. Stueckelberg 3045
Excitation Function for the Disintegration of Li^7 by Low Energy Protons. L. J. Haworth and L. D. P. King 3198
Stopping Power of Li for Low Energy Protons. L. J. Haworth and L. D. P. King 3199

For the **Key** to this **Index** see pp. 1182 to 1194.

Electrons, Neutrons, Positrons and Protons, *continued.*

Abstract Nos.

Effective Cross-Section for Collisions of the Second Kind in Excited Hg Vapour and Hyperfine Structure of Hg Resonance Line 2537 Å. O. Buhl 3247
Application of Transverse Field Methods to Measurement of Ionisation and Discharge Cross-Sections. E. Persico and A. Rostagni 3382
Energy Loss of Positive Electrons in Passing through Al. B. R. Curtis 3383
Calculations on a New Neutron-Proton Interaction Potential. R. G. Sachs and M. Goeppert-Mayer 3384
Scattering of Fast Electrons in Gases. J. B. H. Kuper 3385
Single Scattering of Fast Electrons in Argon. K. Zuber 3386
Calculation of Elastic Scattering of Electrons by Molecular Hydrogen. R. Roscoe 3387
Interaction between an Electron Beam and a Plasma. M. J. Druyvesteyn.... 3388
Probability of Annihilation of Positrons without Emission of Radiation. H. S. W. Massey and E. H. S. Burhop...... 3389
Field Emission of Electrons at Thin Films of Insulating Material of the Type $Al-Al_2O_3-Cs_2O$. J. Mühlenpfordt 3430
Anomalous Scattering of α-Particles. H. S. W. Massey and C. B. O. Mohr .. 3643
Production of Positron-Electron Pairs during the Passage of β-Particles through Matter. N. Feather and J. V. Dunworth 3646
Effect of Electron Interaction on Energy Levels of Electrons in Metals. E. Wigner 3804
Neutron Production through D Canal Rays. W. de Groot and F. M. Penning 3833
Formation of Deuterons by Proton Combination. H. A. Bethe and C. L. Critchfield 3834
Energy Loss of Fast Electrons by Radiation. L. A. Arcimovič and V. A. Chramov 3835
Transmission of Slow Electrons through Thin Collodion Films. M. Ference and R. J. Stephenson 3836
Photographic Intensity-Measurements of Electron Diffraction Patterns. L. S. Ornstein, H. Brinkman, A. Hauer and T. Tol 3837
Secondary Emission of Beryllium. E. G. Schneider 3838
Secondary-Electron Emission from Ni, Co and Fe as a Function of Temperature. L. R. G. Treloar and D. H. Landon 3839
Diffraction of Electrons by Oxide-Coated Kathodes. J. A. Darbyshire 3840
Nuclear Excitation and Partitio Numerorum. K. Umeda 4053
Excitation of Metastable Atoms in a Gas Discharge. V. Fabrikant 4198
Excitation of Radiating Atoms in a Gas Discharge. V. Fabrikant...... 4199
Motion of an Electrified Corpuscle in Presence of a Magnetic Dipole. C. Agostinelli 4224
Atomic Electron Velocities in Hydrogen. A. L. Hughes and M. A. Starr...... 4225
Neutron Scattering Cross-Sections. F. G. Brickwedde, J. R. Dunning, H. J. Hoge and J. H. Manley 4226
Electron Diffraction by Split-Shutter and Back-Reflection Methods. R. Jackson and A. G. Quarrell 4227
Determination of the Cross-Section of Metastable He Atoms with the Aid of their "Photoelectric" Effect. R. Dorrestein and J. A. Smit 4331
Theory of Showers. D. Iwanenko and A. Sokolow 4472
Effective Cross-section for Collisions of the Second Kind in Excited Hg Vapour and Hyperfine Structure of Hg Resonance Line 2537 Å. O. Buhl 4519
Passage of Electrons through Thin Films of Insulators. H. Klarmann and J. Mühlenpfordt 4642
Velocity Distribution of Elastically Colliding Electrons. R. Lichtenstein.... 4670
Scattering and Loss of Energy of Fast Electrons and Positrons in Lead. W. A. Fowler and J. Oppenheimer 4671
Inelastic Scattering of Slow Electrons from a Silver Single Crystal. J. C. Turnbull and H. E. Farnsworth 4672
Scattering of Fast β-Particles by Mercury Nuclei. A. Barber and F. C. Champion 4673
Rutherford Scattering with Radiation. W. Braunbek and E. Weinmann.... 4674
Scattering of D-D Neutrons. S. Kikuchi and H. Aoki 4675
Neutron Resonance Levels of Ir and Rh. R. Jaeckel 4676
Fast Neutrons. H. Reddemann...... 4677
Action of Thermal Neutrons on Aluminium. P. Wang 4678
Natural H-Rays. J. Riedl 4893
Electron-Optical Investigation of the Passage of Slow Electrons (0-200V) through Metal Foil. H. Katz 5051

For the Key to this Index see pp. 1182 to 1194.

Electrons, Neutrons, Positrons and Protons, *continued.*

Abstract Nos.
Passage of Slow Electrons (0-200V) through Metal Foil. H. Katz 5052
Straggling of Electrons due to Radiation and Ionisation Loss. H. C. Corben 5053
Slowing Down of Neutrons in a Proton Gas. K. Husimi 5054
Production of Collimated Beams of Monochromatic Neutrons in the Temperature Range 300–10° K. L. W. Alvarez 5055
Secondary Electron Emission of Beryllium. R. Kollath 5056
Secondary Electron Emission from Wire Gauze. M. Sandhagen 5057

4. Diffusion.

Diffusion of Thermal Neutrons in Aqueous Solutions of Cadmium Nitrate. F. Knauer 1314
Diffusion of Electrons in a Magnetic Field. J. S. Townsend 1730

5. Electron Optics.

Electron Microscopes and Telescopes. G. Gallarati and G. Madia 342
Distortion in a Weak Magnetic Electron Lens. J. Gratsiatos 343
Electron-Optical Imagery of Gas Beams by the Dark Field Method. H. Boersch 344
Temperature of Electrons in a Magnetic Field. A. Slutzkin 345
Focusing of Charged Particles by a Transverse Magnetic Field. L. Cartan 867
Electron Mirrors. G. Hottenroth 868
Application of the Electron Microscope in Biology. F. Krause 869
Electron Microscope in Colloid Investigations. D. Beischer and F. Krause 870
Electron Microscope for Studying Thermal and Secondary Electron Emission. E. Meschter 871
Rapid and Accurate Measurement of Line Positions on X-Ray Diffraction Films with the Aid of a Kathode-Ray Oscillograph. H. Tatel and R. Hultgren 942
Orthogonal Systems of Electron Optics. M. Cotte 1315
Electron-Optical Observation of Metal Surfaces. Parts III and IV. W. G. Burgers and J. J. A. P. van Amstel 1864
Focusing in the Cyclotron. M. E. Rose 1963
Focusing in the Cyclotron. R. R. Wilson 1964
Limits of Resolving Power of the Electron Microscope. M. v. Ardenne 2160
Electron-Optical Kathode Imagery in a Gas Discharge. H. Mahl 2161
Magnetic Field Corrections in the Cyclotron. M. E. Rose 2393
Electron-Optical Theory of Precision Mass Spectrographs. R. Herzog and V. Hauk 2551
Theoretical Resolving Power of the Electron Microscope. R. Rebsch 2605
Progress in Construction and Performance of Ultramiscroscopes. B. v. Borries and E. Ruska 2606
Ultramicroscopic Photographs of Bacteria. B. v. Borries, E. Ruska and H. Ruska 2607
" Phase Focusing " in Rapidly Fluctuating Electric Fields. E. Brüche and A. Recknagel 2608
Geometrical Electron Optics. W. Henneberg 3009
Electron Telescope. S. Malatesta 3390
Further Observations with the Field Electron Microscope. E. W. Müller.... 3429
Path of Electrons through an Electrical Cylindrical Lens. W. Gaedcke 3841
Electron-Optical Examination of Electronic and Ionic Emission from Wires. H. Mahl 3880
Electron-Scan Microscope. Theoretical Fundamentals. M. v. Ardenne 4228
Short Magnetic Lens with Small Spherical Aberration. W. Glaser 4229
Simple Electron Microscopes. R. P. Johnson 4230
Present Position of the Super-Microscope. B. v. Borries and E. Ruska 4231
Equations of Motion of a Charged Particle in an Electromagnetic Field. T. Boggio 4679
Field Distribution and Graphical Ray Tracing in Electron-Optical Systems. L. Jacob 4680
Axial Potential Distribution in Electron-Optical Systems. L. Jacob 4681
Focal Length and Image Quality of Circular Hole Lens with a Central Net. M. Knoll and H. Weichardt 4682
Focusing Properties of Electrostatic Field between Two Cylinders. F. H. Nicoll 4683

Electrons, Neutrons, Positrons and Protons, *continued.*

Abstract Nos.

Paths of Ions in the Cyclotron. Part I. Orbits in the Magnetic Field. Part II. Paths in Combined Electric and Magnetic Fields. L. H. Thomas .. 4901
General Theory of Double Focusing Mass-Spectrographs. R. Herzog and V. Hauk 5026

6. Kathode-Ray Oscillographs, Applications of.

Reflection of α-Particles of RaC′ by Heavy Atomic Nuclei. K. Krammer 146
Damping of Piezoelectric Vibrations. W. Bosshard and G. Busch 1358
Simultaneous Recording of Two Phenomena by Means of the Braun Tube. K. Sedlmayr 2609
Kathode-Ray Oscillographic Study of Anodic Passivation of Gold in Chloride Solutions. J. D. Pearson and J. A. V. Butler 3381
Circuits Producing Sharp Electrical Impulses Free from Curvature and their Use in Oscillographic Work. J. C. Morgan 3417

8. Unclassified.

Action of Kathode Rays on Selenium Cells. A. Becker and E. Kruppke 379
Excitation Function and Energy Distribution of Neutrons Emitted from Boron by Bombardment with α-Particles from Po. W. Maurer 600
Radiation Emitted from Electron-Positron Pairs on Interaction with a Charge. A. Sokolow 627
Problem of the Existence of a Smallest Wave-Length. A. March 628
Statistical Measurement of Electron Rays. K. H. Stehberger 872
Significance of Atomic Entities in Modern Atomic Structure. W. F. G. Swann 1473
Neutrons and White Dwarfs. M. C. Johnson 1908
Corpuscular Rays. Part II. A. Becker 2552
Magnetism and the Vibratory Electron. E. T. Jones 2619

Kathode Phase Inversion. O. H. Schmitt 1532B
Intensity Control of Electron Beams. S. Recknagel 1749B
Theoretical Principles of Electron Optics. R. Sartori 2128B
Negative-Ion Components in the Kathode-Ray Beam. C. H. Bachman and C. W. Carnahan 2130B
Electron Motion in Dynamic Multiplier. W. Majewski 2331B
Secondary Electron Emission. H. Bruining 2332B
Kathode-Ray Oscillograph with After Acceleration. A. Bigalke 2407B
Apparatus for Measuring Scanning Speeds of Kathode-Ray Tubes. L. Block 2911B
Inversion Spectrum of a Kathode-Ray Tube. H. E. Hollmann 3198B
Oscillograph with After Acceleration. A. Bigalke 3200B
Spherical Aberration of Magnetic Lenses. H. Becher and A. Wallraff 3417B
Optics of Electric Charges. P. Bricout 3418B
Symmetry Problem of Braun Tubes. H. Pieplow and E. Steudel 3416B

Electrostatics.

1. Theory.
2. Frictional Electricity.
3. Contact Potential.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
Capacitance, *see* Dielectrics and Capacitance.
Dielectric Constants, *see* Dielectrics and Capacitance.
Units, *see* Mathematical Methods, etc.

1. Theory.

Distribution of Electricity on Two Cylinders. E. P. Adams 348
Electrostatic Problems Connected with Thick Cylindrical Shells. E. P. Adams 873
Two-Dimensional "Ice-Pail." E. P. Adams 874
Potential Problem of a Sphere between Infinite Conducting Planes. C. Hurst 1316
Potentials in Curved Surfaces. G. R. Stibitz 2610

2. Frictional Electricity.

Electrification of Liquid Droplets. G. Lovera and A. Pochettino 1317
Method of Measuring Density of Electrostatic Charges. R. Pinoir 1318
Frictional Electricity. W. H. Jones 1319

Electrostatics, *continued.*

Abstract Nos.
Radiation Emitted on Friction of Solid Dielectrics. F. Perrier 1600
Wave-Length of Radiation Emitted by Electrified Insulators—Theoretical Interpretation. F. Perrier 1974
Powerful H.V. Generator. A. Raskin 3842

3. Contact Potential.

Volta Effect in Vacuum. E. Perucca 349
Contact Capacity between Metals and Semiconductors. G. Dechêne 2137
Thermodynamic Derivation of the E.M.F. of a Gas Voltaic Pile. O. Scarpa .. 2516
Evaporation of Concentrated Films of Sodium. R. C. L. Bosworth 2521
Voltaic E.M.F. in Alloys. Part I. O. Scarpa. Part II. O. Scarpa with C. Rossi 2611
Surface Electrification Due to the Recession of Aqueous Solutions from Hydrophobic Surfaces. I. Langmuir 2740
Contact Potentials of Stearate Films on Metal Surfaces. E. F. Porter and J. Wyman, Jr. 2743
Semiconductor in an Alternating Current. G. Dechêne 3357
Recent Work on Voltaic E.M.F. O. Scarpa 3391
Contact Potential between Liquid and Solid Tin at the Melting Point. H. Kurzke and J. Rottgardt 3392
Contact Potential and Exit-Work. W. Heinze 4266
Contact Potential. B. Gysae and S. Wagener........ 4684
Contact P.D. between Ba and Mg. P. A. Anderson 5058

5. Unclassified.

Explanation of the Coehn-Raydt Law of Charge. A. J. Rutgers 875
Removal of Electric Charge by Current of Air. O. Yadoff 1731
Photoelectrets. G. Nadjakoff. 3037

Emission (Radiation).

1. General Theory (*see also* Mechanics, Quantum).
2. Black-Body Radiation. Total Intensity and Spectral Distribution (Theoretical and Experimental).
3. Selective Radiation.
4. Cosmic Rays.
5. Mechanical Effects (Photophoresis, etc.).
6. Apparatus, *see* Supplementay Index.
7. Unclassified.

Cross-References :
- Electric Waves, *see* Oscillations and Waves, Electric.

Cross-References (contd.) :
- Emissivity and Rate of Cooling by Combined Convection, Conduction and Radiation, *see* Convection of Heat.
- γ-Rays, *see* Radioactivity.
- Solar Radiation, *see* Meteorology.
- Therapeutic Effects, *see* Medical Radiology and Electrology.
- Velocity of Propagation, *see* Transmission (Radiation).
- X-Rays, *see under.*

1. General Theory (*See also* Mechanics, Quantum).

New Solutions of the Equation of Radiative Transfer. L. Spitzer, Jr. 524
Radiation Emitted from Electron-Positron Pairs on Interaction with a Charge. A. Sokolow 627
Problem of the Existence of a Smallest Wave-Length. A. March 628
Theory of the Neutrino. Part II. J. Solomon 629
Radiation Integrals $\int_x^\infty dx/x^a(e^x-1)$. J. R. Airey 964
Nature of Elementary Light Sources and Interference Phenomena. S. I. Wawilow 1133
Theory of Multipole Radiation. J. Blaton 1134
Nuclear Photo-Effects. N. Bohr 1368
Indeterminacy of the Electromagnetic Potentials. B. Kwal 1741
Electromagnetic Properties of Nuclear Systems. W. E. Lamb, Jr. and L. I. Schiff 1761
Dirac Matrix Systems of High Order. R. L. Gomez 1835
Non-Relativistic Theory of Particles with Integral Spin. A. Proca 1972
Spherical Waves in Photon Wave Mechanics. J. Géhéniau 1973
X-Particle. A. Bramley 1975
Propagation of Light in an Atomically Stratified Medium. J. Weigle 1976
Theory of Neutrinos. G. Wataghin 1977

Emission (Radiation), *continued.*

Abstract Nos.

Neutrino Theory of Light. M. H. L. Pryce ... 1978
Critical Velocity in the Materialisation of the Photon. S. A. de Mayolo ... 2414
Three-Dimensional Case in the Neutrino Theory of Light. Part II. A. Sokolow ... 2415
Electromagnetic and Gravitational Radiation. L. Infeld ... 2726
Invariance in the Neutrino Theory of Light. B. S. M. Rao ... 2842
New Experimental Evidence for the Existence of a Neutrino. H. R. Crane and J. Halpern ... 2843
Materialisation of a Photon in an Electron Field. A. M. da Silva ... 2844
Suggested Explanation of the Contradiction between the Rayleigh-Jeans Formula and Experiment. P. B. Carwile ... 2845
Propagation of Light in an Atomically Stratified Medium. Part II. J. Weigle and J. Patry ... 2846
Theory of β-Decay. M. H. Hebb ... 3645
Interaction between a Photon and an Electron, in accordance with Wave Mechanics. J. Géhéniau ... 3658
Equation of Propagation of a Photon in Non-Euclidean Space. M. A. Tonnelat-Baudot ... 3659
Classical Theory of Radiating Electrons. P. A. M. Dirac ... 3660
Theory of Cyclical Transitions. L. G. Henyey ... 3995
Emission of Light-Quanta of Long Wave-Length. W. Pauli and M. Fierz ... 4076
β-Spectrum of RaE near the Upper Limit and Mass of the Neutrino. A. Alichanian, A. Alichanov and D. Dželepov ... 4458
β-Spectrum of ThC near the Limit and Mass of the Neutrino. A. Alichanian and S. Nikitin ... 4459
Analogy between Photon and Electron and Derivation of Quantum Equation. H. T. Flint ... 4470
Čerenkov Radiation. G. B. Collins and V. G. Reiling ... 4471
Theory of Showers. D. Iwanenko and A. Sokolow ... 4472
Rutherford Scattering with Radiation. W. Braunbek and E. Weinmann ... 4674
Integration of Equation of Radiative Transfer. P. Swings and L. Dor ... 4844
Definition of the Neutrino. J. Solomon ... 4906
Straggling of Electrons due to Radiation and Ionisation Loss. H. C. Corben 5053

2. Black-Body Radiation. Total Intensity and Spectral Distribution (Theoretical and Experimental).

Table of Planck's Function from 3500 to 8000° K. P. Moon ... 1592
Intensity Distribution in the White Light of Electrically Excited Xenon. F. Gans ... 2416
Radial Inhomogeneity in Emission from an Indirectly Heated Hg Discharge Tube. E. Fischer and H. König ... 2417
Isochromatic Energy Curves for Black Body in the Region 2800–3060 Å. I. L. Roich ... 2418
Photon Emission of a Black Body. A. E. Haas ... 2847
Influence of Moisture on the Intensity of the Visible Radiation of the Flame of CO and O_2. H. Kondratjewa and V. Kondratjew ... 2945
Stefan's Radiation Law, Nernst's Heat Theorem and the Pressure of Radiation. E. Guth and A. E. Haas ... 3209
Stefan's Law and Non-Linear Electrodynamics. B. Kwal and J. Solomon 3210
Establishment of Scale of Colour Temperature. H. Djoudat ... 3306
Artificial Daylight. R. Toussaint ... 4904

3. Selective Radiation.

Point Source of Continuous Ultra-Violet Spectrum. F. Almasy ... 644
Two-Prism Spectrograph for Studying U.V. Sources of Radiation and Photographic Emulsions. P. Gesteau ... 3742
Source of Mercury Resonance Radiation of High Intensity for Photochemical Purposes. E. W. R. Steacie and N. W. F. Phillips ... 4077
Progress in Infra-Red Technique. M. Czerny and H. Röder ... 4561

4. Cosmic Rays.

Cloud Chamber Investigations of Cosmic-Ray Interactions with Matter. G. L. Locher ... 154

Emission (Radiation), *continued.*

Abstract Nos.

Production of Cosmic-Ray Showers at Great Depths. W. H. Pickering 155
Angular Distribution of Pairs Produced in Pb by Penetrating or Hard γ-Radiation. H. Adam, G. Burkhardt 333
Nuclear Transformations and Cosmic Radiation. W. Bothe, W. Gentner, H. Maier-Leibnitz, W. Maurer, E. Wilhelmy and K. Schmeiser 593
Nuclear Disintegration Produced by Cosmic Rays. R. B. Brode and M. A. Starr 594
Distintegrations Induced by High-Energy Electrons. J. Solomon 599
Collision of a High Energy Neutrino with a Neutron. S. Tomonaga and H. Tamaki 630
Origin of Cosmic Radiation. Part II. H. Alfvén 631
Nature of Cosmic-Ray Particles. Y. Nishina, M. Takeuchi and T. Ichimiya 632
Heavy Particles in Cosmic Rays. V. Veksler and B. Isajev 633
Cosmic-Ray Showers. V. Veksler and B. Isajev 634
Energy Distribution in Cosmic-Ray Showers. K. Barschauskas 635
Cosmic-Ray Showers. H. Geiger 636
Production of Cosmic-Ray Showers in Lead. M. A. Starr 637
Theoretical Investigation of Cosmic-Ray Data. H. Euler 638
Cosmic Rays and Latitude Effect. A. Ehmert 639
Latitude Effect in Cosmic Radiation at High Altitudes. S. A. Korff, L. F. Curtiss and A. V. Astin 640
Latitude Effect for Cosmic-Ray Showers. H. V. Neher and W. H. Pickering 641
Cosmic-Ray Observations in the Stratosphere. L. F. Curtiss, A. V. Astin, L. L. Stockmann, B. W. Brown and S. A. Korff 642
Penetrating Component of Cosmic Radiation. H. J. Bhabha 643
Summary of the Year's Work, Department of Terrestrial Magnetism, Carnegie Institution of Washington. J. A. Fleming 1110
Cosmic Radiation and Activity of Meteors. J. Zirkler 1135
Cosmic Radiation as an Intra-Galactic Phenomenon. H. Alfvén 1136
Cosmic-Ray Shower-Production from Carbon. A. Valkó 1137
Cosmic-Ray Shower Photographs Underground. C. Haenny 1138
Energy Flux of Corpuscular Cosmic Radiation. C. G. Montgomery and D. D. Montgomery 1139
Heavy Particles in Cosmic Rays. P. Auger 1140
Nature of Cosmic Rays. I. S. Bowen, R. A. Millikan and H. V. Neher 1141
Penetration of Corpuscular Cosmic Rays in Matter. J. Clay and K. H. J. Jonker 1142
Analysis of the Cosmic Radiation Complex. J. Clay 1143
Soft Final Corpuscular Rays Produced by Cosmic Rays in the Walls of an Ionisation Chamber. J. Clay and J. de Bock 1144
Magnetic Storm and Variation of Cosmic Rays. J. Clay and E. M. Bruins 1145
Ionisation and Conductivity in Gases at High Pressures. J. Clay 1266
Observations in Highest Stratosphere Flight 1545
Disintegration of Nuclei by Cosmic Rays. A. Filippov, A. Gdanow and I. Gurevich 1574
Artificial Radioactivity Produced by Cosmic Rays in Lead and Iron. J. Clay and K. H. J. Jonker 1575
Cosmic-Ray Recorders. A. Dauvillier 1593
Cosmic-Ray Cloud Chamber Photographs, and Evidence for Heavy Particle. P. Ehrenfest, Jr. 1594
Variation of Cosmic-Ray Ionisation with Chamber Pressure. B. Vinzelberg 1595
Proportion of Electrons to Photons in Cosmic-Ray Showers. H. Geiger and O. Zeiller 1596
Cosmic-Ray Intensities at Great Depths. V. C. Wilson 1597
Nature of the Penetrating Component of Cosmic Rays. P. M. S. Blackett 1598
Absorption of Cosmic Radiation in Various Materials. A. Sittkus 1979
Ionising Power of Cosmic Rays. E. Stuhlinger 1980
Altitude Effect on the Specific Ionising Power and Zenith Angle Distribution of Cosmic Rays. D. K. Froman and J. C. Stearns 1981
Latitude and Asymmetry Effects on Cosmic Rays. O. Godart 1982
Penetrating Component of Cosmic Radiation. T. Grivet-Meyer 1983
Cosmic Radiation and Magnetic Storm of Jan. 1938. W. Kolhörster 1984
Variations of Cosmic Radiation during Magnetic Storms. T. H. Johnson 1985
Terrestrial Magnetism and Cosmic-Ray Intensity. V. F. Hess, A. Demmelmair and R. Steinmaurer 1986

For the **Key** to this Index see pp. 1182 to 1194.

Emission (Radiation), *continued.*

Abstract Nos.

Intensity of Primary Cosmic Radiation and its Energy Distribution. T. H. Johnson 1987
Scattering of Cosmic-Ray Particles in Metal Plates. P. M. S. Blackett and J. G. Wilson 1988
Cosmic-Ray Ionisation near a Lead Block. E. G. Schneider 1989
Magnetic Storm and Variation of Cosmic Rays. J. Clay and E. M. Bruins 2419
Direct Photographic Record of Cosmic Rays. T. Takéuchi and T. Sugita 2420
Rate of Production of Very Large Cosmic-Ray Bursts as a Function of Lead Shielding Thickness. W. P. Jesse and R. L. Doan 2421
New Analysis of Cosmic Radiation Including the Hard Component. L. W. Nordheim 2422
Hard Cosmic-Ray Showers. K. Schmeiser and W. Bothe 2423
Cascade Theory of Electronic Showers. L. Landau and G. Rumer.......... 2424
Heavy Electrons and Theories of Nuclear Phenomena. G. Wentzel.......... 2647
Detection of Cosmic Rays and Neutrons by Photographic Plates. M. Blau and H. Wambacher 2848
Direct Photographic Detection of Heavy Particles in Cosmic Radiation. M. Blau and H. Wambacher 2849
Variation of Cosmic Radiation Intensity with Local and Sidereal Time at 2300 cm. A. Demmelmair 2850
Cosmic Rays. B. Rossi 2851
Cosmic-Ray Counter with High Resolving Power. R. Maze 2852
Specific Ionisation and Mass Cosmic-Ray Particles. D. R. Corson and R. B. Brode 2853
New Light on the Nature and Origin of the Incoming Cosmic Rays. I. S. Bowen, R. A. Millikan and H. V. Neher 2854
Influence of the Solar Magnetic Field upon Cosmic Rays. P. S. Epstein 2855
Energy Loss of Penetrating Cosmic-Ray Particles in Copper. J. G. Wilson 2856
Showers Produced by Cosmic Radiation. W. Heitler 2857
Atmospheric Absorption of Cosmic Rays. B. Gross 2858
Altitude Effect on the Specific Ionising Power and Zenith Angle Distribution of Cosmic Rays. D. K. Froman and J. C. Stearns 3211
Heavy Electrons in Cosmic-Ray Showers Originating in the Atmosphere. P. Auger, R. Maze and T. Grivet-Meyer 3212
Transition Effects of Cosmic Rays in the Atmosphere. H. Snyder 3213
Energy Determination of Cosmic Rays by Magnetic Deflection. H. D. Rathgeber 3214
Compton Scattering of Radiation in a Star. A. B. Severny 3594
Dependence of Ionisation by Penetrating- and γ-Radiation upon Pressure. J. Clay 3652
Improvement in Coincidence-Counting Circuit. S. Gorodetzky 3654
Large Cosmic-Ray Bursts and Cascade Theory. C. G. Montgomery and D. D. Montgomery 3661
Solar Diurnal Variation of Cosmic-Ray Intensity as a Function of Latitude. J. L. Thompson 3662
Sidereal Time Variation of Cosmic Radiation. H. Alfvén 3663
Cosmic-Ray Intensity at High Elevations in Northern Latitudes. T. H. Johnson 3664
General Theory of the Earth's Shadow Effect of Cosmic Radiation. E. J. Schremp 3665
Simple Shadow Cone of Cosmic Radiation. E. J. Schremp 3666
Cosmic Rays and Nuclear Forces. I. Tamm 4078
Heavy Electrons in Cosmic Rays. V. Veksler and N. Dobrotin 4079
Earth's Magnetic Field and Cosmic Radiation. V. F. Hess, A. Demmelmair and R. Steinmaurer 4080
Absorption of Penetrating Component of Cosmic Radiation. W. M. Nielsen and K. Z. Morgan 4081
Residual Currents and Deep Water Measurements of Cosmic Rays. S. Szczeniowski and S. Ziemecki 4082
Large Atmospheric Cosmic-Ray Showers. P. Auger and R. Maze 4083
Cosmic-Ray Showers under 30 m. of Clay. J. D. Crawshaw 4084
Shower Frequency and Cosmic-Ray Intensity. L. Jánossy 4085
Transition Effects of Cosmic Rays in the Atmosphere. R. Serber 4086
Nature of Primary Cosmic Radiation. T. H. Johnson 4473
Theory of Cosmic-Ray Phenomena. H. Euler and W. Heisenberg 4474

For the **Key** to this Index see pp. 1182 to 1194.

Emission (Radiation), *continued.*

Abstract Nos.
Absorption of Cosmic Rays in Water to Depth of 440 m. J. Clay, A. v. Gemert and P. H. Clay 4475
Zenith-Angle Intensity Distribution of Cosmic Rays. J. Clay, J. T. Wiersma and K. H. J. Jonker 4476
Cosmic-Ray Effects Associated with Magnetic Storms. S. E. Forbush 4477
Bursts in Cosmic Radiation in the Equatorial Zone. S. A. Korff 4478
Multiplicative Production of Hoffmann Bursts. H. Euler 4479
Hard Cosmic-Ray Showers. K. Schmeiser 4480
Absorption of Shower-Producing Component of Cosmic Radiation in Iron and Lead. J. Crudup 4481
Report on the Work of the Bartol Research Foundation, 1937–1938. W. F. G. Swann 4482
Researches on Cosmic Rays, 1933–1938. R. Steinmaurer 4907
Cosmic-Ray Showers and Bursts. D. K. Froman and J. C. Stearns........ 4908
Penetrating Power of Cosmic-Ray Shower Particles. L. Jánossy 4909
Ray Multiplication in Cosmic-Ray Showers. H. Geiger and M. Heyden...... 4910
Energy Loss of Cosmic Rays in Penetrating 9 cm. of Gold. P. Ehrenfest, Jr... 4911
Counter Systems for Measuring Cosmic Rays of Very Small Intensity. A. van Gemert........ 4912
Absolute Intensity of Cosmic Rays at Sea Level. J. Clay and P. H. Clay...... 4913

7. Unclassified.

Ionising Radiations Emitted by Metals. G. Reboul and J. Reboul 156
Radiation Emitted on Friction of Solid Dielectrics. F. Perrier.............. 1600
Wave-Length of Radiation Emitted by Electrified Insulators—Theoretical Interpretation. F. Perrier 1974
Calculation of Heating of Conductors by Current or by Radiation. J. Fischer 2202
Reduction of Scale Deflections in Radiometry. T. E. Sterne 2425
Emission of Short U.V. Radiation during Structure Formation. Part I. Radiation during Typical Coagulations. A. Rabinerson and M. Filippov 3215

Fluorescence and Phosophorescence. Luminescence and Afterglow.

1. Fluorescence.
2. Phosphorescence.
3. Luminescence and Afterglow.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-Reference :
Fluorescence and Phosphorescence Spectra, *see* Spectroscopy.

1. Fluorescence.

Fluorescence of Octohydrofluorocyclene, $C_{48}H_{36}$. S. Pieńkowski 157
Fluorescence and Absorption of Biacenaphthylidene, $C_{24}H_{16}$. B. Twarowska 158
Wave-Length Dependence of Fluorescence of Biacenaphthylidene Solutions. Z. Lewkowicz 159
Influence of Admixed Gases and of a Magnetic Field on the Degree of Polarisation of the Fluorescence of Iodine Vapour. S. Mrozowski 160
Quenching of Fluorescence of Solids by Adsorbed Gases. V. Hachkovski and A. Terenin 161
Determination of Real Fluorescence Polarisation of Solutions at High Concentrations. S. I. Wawilow 162
Fluorescence Depolarisation of Solutions at High Concentrations. S. I. Wawilow, P. G. Gluchow and I. A. Khwostkow........ 163
Fluorescence of Divalent Rare Earths. B. Karlik and K. Przibram........ 645
Fluorescence of Divalent Rare Earths. K. Przibram 646
Fluorescence in a Layer of Thickness Comparable to Wave-Lengths. F. S. Baryšanskaja 647
Influence of Temperature on the Fluorescence of Anthracene in Paraffin Oil. S. Gryglewicz 648
Quenching of Fluorescence of Dye Solutions by Foreign Substances. Part II. Influence of the Solvent. B. J. Sveshnikoff........ 649
Influence of the Magnetic Field on the Fluorescence of Mercury Vapour and Zeeman Effect in Band Spectra of Loosely-Bound Molecules. S. Mrozowski........ 724
Fluorescence and Phosphorescence Phenomena of Aragonite-Like Calcites. S. v. Gliszczynski and E. Stoicovici 1147
Anomalous Anti-Stokes Fluorescence. F. Duschinsky 1148

Fluorescence and Phosphorescence. Luminescence and Afterglow, *continued.*

Abstract Nos.
Determination of the Efficiency of Fluorescence. H. Hellström 1149
Photosensitising Action and the Fluorescence of Uranium Salts. J. Weiss 1601
Excitation of Gases. Part II. W. Hanle 1703
Spectral Investigations of Fluorites. G. Wild 2861
Fluorescence of Methyl Acridone. Influence of Electrical Atomic Fields. A. Schöntag and H. Fischer 2862
U.V. Radiation of Crystals under the Action of γ-Rays. E. K. Zavadovskaya 3216
Fluorescence of Chlorins. A. Stern 3667
Fundamental Polarisation and Temperature. A. Jabłoński 3695
Powerful Fluorescence of Calcareous Minerals. M. Déribéré 4087
Colour and Fluorescence of Dyestuffs. B. Bugyi 4088
Fluorescence and Photodecomposition of Acetone Vapour. M. S. Matheson and W. A. Noyes, Jr. 4089
Fluorescent Ion of Chromium in Ruby. B. V. Thosar 4090
Fluorescence in a Layer of Thickness Comparable to Wave-Lengths. Part II. F. S. Baryšanskaja 4091
Polarisation of Band Fluorescence of Metal Vapours. S. Mrozowski 4092
Raman Spectrum and Fluorescence of Dioxane. H. W. Hunter 4147
Fluorescent Chromium Ion in Ruby. B. V. Thosar 4914

2. Phosphorescence.

Decay of Phosphorescence of ZnS at Various Temperatures. V. Antonov-Romanovskij 650
Influence of an Electric Current on Phosphorescence of Semiconducting Zinc Sulphide. G. Déchêne 651
Alkali-Halide Phosphors Containing Heavy Metals. R. Hilsch 652
Photography of Dark Hot Bodies. T. Takéuchi and T. Sugita 668
Emission Spectra of Nd^{+++} Ions in Phosphors and their Absorption Spectra in Crystals. P. C. Mukherji 695
Kinetics of Phosphorescence. D. Blochinzew 1602
U.V. Phosphorescence of X-Rayed Rock-Salt Crystals. M. N. Diatchenko 1990
Alkali Halide-Thallium Phosphors. F. Seitz 1991
Phosphorescent Zinc Sulphide. W. H. Byler 1992
Growth and Decay of Phosphorescence in Calcium Sulphide by a Photoelectric Method. P. J. Mulder 2426
Inorganic Phosphors without Metallic Activator. W. H. Byler 2863
ZnS Phosphors. F. Seitz 3668
Automatic Intensity Recorder for Photon Counters. M. Kato 4923

3. Luminescence and Afterglow.

Coloration and Luminescence of Fluorite. E. W. Kellermann 164
Luminescence of Fluorites and Other Minerals. Part III. H. Haberlandt .. 165
Electric and Luminescent Properties of Willemite under Electron Bombardment. W. B. Nottingham 166
Luminescence in Liquids under Ultrasonic Treatment. V. L. Levšin and S. N. Rževkin 167
Recombination in the Afterglow of a Mercury Discharge. F. L. Mohler 168
Luminescence of Scapolite. E. Iwase 653
Chemiluminescence of Phthalhydrazide Derivatives. C. N. Zellner and G. Dougherty 654
Luminescent-Photographic Measurement of Ultra-Violet Energy Distribution. L. N. Ananjeva and A. A. Shishlovsky 693
U.V. Luminescence of Rock-Salt after Irradiation by X-Rays. M. L. Katz .. 1150
Luminescence in the Cold Oxidation of Phosphorus and the Energy of Dissociation of PO. K. Rumpf 1603
Kathodoluminescence of Calcium Silicate. E. Iwase and S. Iimori 1604
Active Nitrogen. D. B. McNeill 1605
Luminescence and Colour Excited by Radium in Glasses. B. E. Cohn and S. C. Lind 1993
Trimethylene Biradical. C. E. H. Bawn and R. F. Hunter 2213
Chemiluminescence of a 3-Aminophthalic Hydrazide. B. J. Svešnikov 2864
Nonadiabatic Reactions. Chemiluminescence. M. G. Evans, H. Eyring and J. F. Kincaid 3322
Thermo-Luminescence of Quartz Exposed to X-Rays. T. Futagami 3669

Fluorescence and Phosphorescence. Luminescence and Afterglow, *continued.*

Abstract Nos.

Kathodoluminescence of Luminescent Al_2O_3. E. Iwase ... 3670
Formation and Excitation of Molecular Ions in Active Nitrogen. U. Stille .. 3671
Preparation and Properties of Auroral Afterglows. J. Kaplan ... 3672
Luminescent Materials and Applications to Light Sources. J. W. Ryde 4093
Nitrogen Afterglows. D. B. McNeill and K. F. Harvey ... 4483

5. Unclassified.

Low Pressure Mercury Discharge within Luminescent Tube. W. Uyterhoeven and G. Zecher ... 3547B
Fluorescence and Phosphorescence. J. H. Gisolf and W. de Groot ... 3548B
Light Production by Luminescent Materials. A. Rütternauer ... 3549B

Fusion and Solidification.

1. Melting Points.
2. Liquefaction and Solidification.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References :
Latent Heat, *see* Calorimetry.
Standard Fixed Points, *see* Temperature.
Thermodynamic Theory, *see* Thermodynamics.

1. Melting Points.

Melting Point of Silicon. F. Hoffmann and A. Schulze ... 247
Melting of Mononitrophenols at High Pressure. R. B. Dow and H. B. Hibshman ... 248
Calorimetric Measurements on Refrigerants. A. Perlick ... 758
Fusion Point, Vapour Pressure and Heat Evaporation of Vanadium Oxytrichloride. H. Flood, J. Gørrissen and R. Veimo ... 765
Phase Diagram of Water to 45,000 kg./cm². P. W. Bridgman ... 781
Freezing Points of Pure Hydrocarbons of the Gasoline Boiling Range and of their Binary Mixtures. J. Smittenberg, H. Hoog and R. A. Henkes 1241
Melting Temperatures of Compounds Adsorbed on Silica Gel. W. A. Patrick and W. A. Kemper ... 2073
Effect of Surface Forces on Melting. W. A. Patrick and W. A. Kemper ... 2074
Reproducibility of the Ice Point and the Triple Point of Water. J. A. Beattie, Tzu-Ching Huang and M. Benedict ... 2075
Formulæ for Calculation of the Velocity of Sound and of the Melting Point. R. Gianasso ... 2095
Freezing Point Curves of Dicetyl in Hydrocarbons. W. F. Seyer ... 2504
Ice-Point as Standard of Reference. E. E. Roper ... 2506
Supercooling and Freezing of Water. N. E. Dorsey ... 2931
Freezing Points of Concentrated Aqueous Solutions of Urea, Urethan and Acetamide. H. M. Chadwell and F. W. Politi ... 3305
Melting Points of Paraffins and Fatty Acids. E. B. Moullin ... 3766
Freezing Point of Methanol; Simple Cryostat. E. E. Roper ... 3767
Communal Entropy and the Theory of Fusion. O. K. Rice ... 3783
Physical Chemical Properties of cis- and trans-Decahydronaphthalene. W. F. Seyer and R. D. Walker ... 4580
Intensity of Orbital Interaction in Transition Elements. R. Forrer ... 4984
Cryoscopy in Saline Solutions. E. Cornec and H. Muller ... 4985

2. Liquefaction and Solidification.

Correlation of Fluidity Curves with Freezing-Point Curves in Binary Systems. R. H. Ewell ... 249
Expansion of Glass with Tempering and Annealing. E. Rencker ... 1171
Tempering and Annealing of Boric Anhydride Glass. E. Rencker ... 1172
Boundary of Softening Range for Binary System $Na_2B_4O_7$-B_2O_3. A. Leontjewa ... 1173
Low-Temperature Researches. J. D. Cockcroft ... 2934
Optical and Dimensional Changes in Freezing and Melting of Rubber. W. H. Smith and C. P. Saylor ... 4290
Solidification Diagram of Al-Cu Alloys. W. Broniewski, S. Jelnicki and M. Skwara ... 4581

Fusion and Solidification, *continued.*

4. Unclassified.

Abstract Nos.
Ordering and Transformations in Condensed Phases. F. C. Frank, K. Wirtz and M. v. Laue 5000

Galvanomagnetic and Thermomagnetic Effects.

1. Galvanomagnetic Effects:
  (*a*) Hall and Corbino Effects.
  (*b*) Ettingshausen Effect.
  (*c*) Change of Resistance in Magnetic Field.
2. Thermomagnetic Effects:
  (*a*) Nernst Effect.
  (*b*) Leduc Effect.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

1. Galvanomagnetic Effects.

(*a*) *Hall and Corbino Effects.*
Electrical and Optical Properties of Oxides of Cd, Tl and Sn. G. Bauer 836
Four Transverse Magnetic Effects in Copper: New Measurements. E. H. Hall 1320
Resistivity Changes of Bivalent Metals, having Body-Centred Cubic Structure, in Transverse and Longitudinal Fields. M. Kohler 1322
Galvanomagnetic Effects in Bi Alloys. N. Thompson 1321
Peculiarities of Hall Effect in Zn Single Crystals. M. M. Noskov 2613
Change of Resistance of Zn Single Crystals in a Magnetic Field. B. G. Lasarew and M. M. Noskov 2614
Four Magnetic Transverse Effects in Copper and their Changes with Temperature. E. H. Hall 3011
(*b*) *Ettingshausen Effect.*
Four Transverse Magnetic Effects in Copper: New Measurements. E. H. Hall 1320
Four Magnetic Transverse Effects in Copper and their Changes with Temperature. E. H. Hall 3011
(*c*) *Change of Resistance in Magnetic Field.*
Magnetic Behaviour of Current-Carrying Supraconductors on Transition to Supraconducting State. K. Steiner 303
Magnetic Induction and Supraconductivity. J. Stark, K. Steiner and H. Schoeneck 304
Electrical Conductivity of Tungsten Single Crystals at Low Temperatures in Strong Magnetic Fields. E. Justi and H. Scheffers 305
Theory of Semiconductors in Magnetic Fields. M. Sen Gupta 876
Change of Resistance of Aluminium Single Crystals in Strong Magnetic Fields at Low Temperatures. E. Justi and H. Scheffers 1732
Variations of Resistance of Electric Conductor in a Magnetic Field. F. van Bergen 2163
Influence of Transverse Magnetic Fields on Electrical and Thermal Conductivity of Pure Metals at Low Temperatures. E. Grüneisen and H. Adenstedt 2615
Effect of Transverse Magnetic Field on Thermal Resistance of Pure Metals. E. Grüneisen 2616
Influence of Magnetic Fields on Electrical Resistance of Pure Metals. M. Kohler 2617
Amorphous Carbon Resistance-Thermometer Heaters at Low Temperatures. W. F. Giauque, J. W. Stout and C. W. Clark 2937
Dependence of Resistance of Nickel Crystal on Direction of Magnetisation. W. Döring 3012
Magneto-Resistance Change of Ferromagnetics in Alternating Magnetic Field. S. Sharan 3843
Conductivity of Lead Crystals at Low Temperatures in Strong Transverse Magnetic Fields. E. Justi and H. Scheffers 4233
Magnetically Orientated Bismuth. A. Altma 4243

2. Thermomagnetic Effects.

(*a*) *Nernst Effect.*
Four Transverse Magnetic Effects in Copper: New Measurements. E. H. Hall 1320
Four Magnetic Transverse Effects in Copper and their Changes with Temperature. E. H. Hall 3011
Thermomagnetic Longitudinal and Tranversal Effect in Nickel. P. Wagner 4687

Galvanomagnetic and Thermomagnetic Effects, *continued.*

Abstract Nos.

(*b*) *Leduc Effect.*

Four Transverse Magnetic Effects in Copper: New Measurements. E. H. Hall 1320
Four Magnetic Transverse Effects in Copper and their Changes with Temperature. E. H. Hall 3011

4. Unclassified.

Temperature Scale below 1° K. W. Jacyna 250
Influence of a Longitudinal Magnetic Field on the Thermoelectric Power of Ni and of Ferro-Nickels Submitted to Traction. G. Simon and J. Bouchard 899
Effect of Cold Working and Heat Treatment on the Electric and Magnetic Properties of Pure Nickel. Part I. Drawn Nickel Wire. H. Bittel 1709
Thermomagnetic Properties of Ag-Cd and Cu-Cd Systems. N. Perakis and L. Capatos 2164
Physical Basis of Some Metallurgical Problems. W. Gerlach 3404
Effect of Cold Working and Heat Treatment on the Electric and Magnetic Properties of Pure Nickel. Part II. Twisted and Stretched Nickel. H. Bittel 4204
Thermomagnetic Anomaly at Ordinary Temperatures in Microcrystalline Ferromagnetic Substances. A. Michel and M. Gallissot 4234

Geodesy.

1. Theory.
2. Measurements.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References:
Isostasy, *see* Gravitation.
See also Latitude and Longitude.

1. Theory.

Determination of the Earth's Plasticity from the Post-Glacial Uplift of Scandinavian Isostatic Adjustment. F. A. V. Meinesz 113
Figure of the Earth. N. E. Nörlund 3163
Gravity Reductions and the Figure of the Earth. B. L. Gulatee 4017
Equatorial and Meridional Moments of Inertia of the Earth. N. Mihal 4418

2. Measurements..

Determining the Geoid by Levelling. K. Muto 2782
Measurement of Angles. C. Schmerber, P. Tardi and P. Caillol 4336

Geophysics, Applied.

1. Surveying and Prospecting:
  (*a*) Electrical Methods.
  (*b*) Gravitational Methods.
  (*c*) Magnetic Methods.
1. Surveying and Prospecting (*contd.*):
  (*d*) Seismic Methods.
2. Apparatus, *see* Supplementary Index.
3. Unclassified.

1. Surveying and Prospecting.

(*a*) *Electrical Methods.*

Electrical Vertical Soundings from the Earth's Surface with the Central Induction Method. J. G. Koenigsberger 1073
Self-Potentials over Ore-Bearing Beds. A. Belluigi 1074
Field Strength and Current Density of a Dipole in the Earth's Surface. G. de Niem. 1108
Dielectric Constant of Metallic Suspensions and the Measurement of Ore Content. H. Löwy and M. M. Ghali. 1928
Simultaneous Transmission and Reception of Electric Waves. F. Minaw and H. Antoun 2639
Triode Hysteresis. A. Iskander 4257

(*b*) *Gravitational Methods.*

Comparison of Direct and Loop Measurements with the Thyssen Gravimeter. S. v. Thyssen 3072
Error Frequency Curves as a Measure of Accuracy and their Employment with the Thyssen Gravimeter. F. Lubiger 3073

Geophysics, Applied, *continued.*

Abstract Nos.

(*d*) *Seismic Methods.*

Velocity of Elastic Vibrations in Small Specimens. A. E. Ostrovskij 1423
Structure of the Earth as Revealed by Seismology. E. A. Hodgson 4026
Explanation of Different Wave Groups in Seismograms of Explosions. R. Köhler 4874

3. Unclassified.

Design and Testing of Geophones and their Amplifiers. E. C. Bullard and C. K. Grant 2784

Short Waves in Radio Geology. V. Fritsch 1017B
Properties of Geological Conductors. V. Fritsch 1838B
Spark Geology. Part VI. V. Fritsch 2527B

Gravitation.

1. General.
2. Terrestrial Gravity.
3. Value of "G."
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
Gravitational Prospecting, *see* Geophysics, Applied.
Pendulums, *see also* Mechanics, Classical.

1. General.

Deflection of Light Rays in the Sun's Gravitational Field. A. v. Brunn and H. v. Klüber 69
Stokes' Formula in the Theory of Gravitation. G. Garcia and A. Rosenblatt 1817
System of Gravitational Equations of the First Order. G. Wataghin 2290
Mass and Gravitation. J. Roubaud-Valette 3100
Reduction of Einstein's Gravitational Equations to the Normal Form. A. Finzi 3540

2. Terrestrial Gravity.

Second-Order Disturbance Terms in Pendulum Observations at Sea. F. A. V. Meinesz 48
Series of Values of "g" about a Given Station. A. Guillet 450
Gravity Anomalies from Deflections of the Vertical. H. Jeffreys 451
Gravity Measurement. G. Ising 951
Deep-Focus Earthquakes and Anomalies of Terrestrial Magnetism and Gravity. S. W. Visser 1096
Strength of the Earth's Outer Shells. R. A. Daly 2789
Comparison of Direct and Loop Measurements with the Thyssen Gravimeter. S. v. Thyssen 3072
Error Frequency Curves as a Measure of Accuracy and their Employment with the Thyssen-Gravimeter. F. Lubiger 3073
Marine Gravimetric Methods and Surveys. M. Ewing 3074
Second-Order Disturbance (Browne) Terms in Pendulum Observations at Sea. F. A. V. Meinesz 3075
Thickness of the Isostatic Earth's Crust. C. Tsuboi 3505
Rapid Measurement of Relative Value of "g". G. Bertrand 3927
Graphical Enumeration of Results in Gravimetry. F. Breyer 3928
Gravity Reductions and the Figure of the Earth. B. L. Gulatee 4017
Magnetic Anomalies and Subterranean Structure. T. Nagata 4022
Gravity Anomalies and Subterranean Mass Distributions. C. Tsuboi 4023
Gravity Anomalies and Subterranean Mass Distribution. Part II. C. Tsuboi and T. Fuchida 4024
Precise Measurement of "g". A. Guillet 4780
Magnetic Anomalies and Subterranean Mass Distribution. T. Nagata 4853

5. Unclassified.

Synthetic Law of Gravitation and Electromagnetism. J. Hély 2394B

Hydrodynamics and Aerodynamics.

1. Aerodynamical Theory.
2. Hydrodynamical Theory.
3. Measurement of Fluid Flow.
4. Apparatus, *see* Supplementary Index
5. Unclassified.

1. Aerodynamical Theory.

Abstract Nos.
Extensions of the New Family of Wing Profiles. R. W. Piper 49
Production and Dissipation of Vorticity in a Turbulent Fluid. G. I. Taylor 50
Asymmetry of the Stress Tensor. S. Fujiwhara 452
Experiment Study of Two-Dimensional Fluid Motion. A. Favre 453
Two-Dimensional Hydrodynamical Theory of Moving Aerofoils. Part II. R. M. Morris 952
Spectrum of Turbulence. G. I. Taylor 953
Gyroscopic Movement of Projectiles. R. d'Adhémar 1461
Equilibrium of a Ball Supported by a Vertical Air-Jet. G. D. Yarnold 1818
Non-Static Problems in Hydrodynamics. G. Krall 3506
Air Movement with Very Low Reynolds Numbers. J. Luneau 3507
Efficiency of Air-Screws. R. Esnault-Pelterie 3508
Application of Line Integral Theorems of Hydrodynamics to Terrestrial and Cosmical Vortices. H. Philipps 4035
Turbulence of an Air Current. K. Kitagawa 4323
Drag Coefficient of Plate in Steady Stream. T. Okaya 4324
Flow of a Compressible Fluid Past a Circular Cylinder. I. Imai 4325
Forces on Two Spheres Placed in Uniform Flow. D. Endô 4326
Transition from Laminar to Turbulent Flow in the Boundary Layer of a Sphere. S. Tomotika and I. Imai 4327
Approximate Prediction of Skin Friction and Lift. N. A. V. Piercy, J. H. Preston and L. G. Whitehead 4781

2. Hydrodynamical Theory.

Plane Motion of Incompressible Fluid. I. Imai 51
Dynamics of Compressible Fluids at Supersonic Velocities. C. Ferrari 52
Fluid Motion Devoid of Acceleration. E. Merlin 454
Verification of Stokes' Theory of a Sphere Oscillating in a Liquid. D. S. Subrahmanyam 455
Partition of the Energy Dissipated in the Turbulent Flow of an Incompressible Fluid. J. K. de Fériet and A. Martinot-Lagarde 456
Statistical Theory of Isotropic Turbulence. T. de Kármán and L. Howarth 457
Radiation Stresses of Transverse Inertial and Viscous Waves in Liquids. R. Lucas 762
Hydrodynamic Analogy for Shearing Stress Distribution in Bending. M. A. Biot 945
Velocity and Temperature Distributions in the Wake behind a Heated Body of Revolution. S. Goldstein 954
Velocity and Temperature Distributions in the Turbulent Wake behind a Heated Body of Revolution. S. Tomotika 955
Application of the Modified Vorticity Transport Theory to the Turbulent Spreading of a Jet of Air. S. Tomotika 956
Instability of Fluids Heated from Below. K. Chandra 1237
Transverse Bands in Layers of Air Heated from Below. D. Avsec 1238
Suggested Verification of Rayleigh's Criterion. P. Vernotte 1239
Comparison of the Method of Variables (φ, ψ_1, ψ_2, t) and the Method of Eulerian and Lagrangian Variables. D. Riabouchinsky 1426
Approximate Equations of Motion in Three Dimensions of a Perfect Compressible Fluid. D. Riabouchinksy 1427
Theory of One-Dimensional Unsteady Fluid Flow in Pipes. I. A. Čarnyi 1428
Hydrodynamical Theory of Lattices, and Certain Boundary Problems, which Lead to Periodic Functions of a Complex Variable. L. Sedov 1429
Solution of the Laminar Boundary Layer Equations. L. Howarth 1430
Boundary Layer Calculations. L. Prandtl 1431
Distribution of Velocity in Turbulent Flow. J. J. Sommer 1432
Experimental Determination of the Spectrum of Turbulence. L. F. G. Simmons and C. Salter 1433
Equilibrium of a Vortex Maintained in a Sudden Expanding Stream. A. Miyadzu 1434
Viscosity of Liquid Helium below the λ-Point. P. Kaptiza 1497

Hydrodynamics and Aerodynamics, *continued.*

Abstract Nos.

Surface Motion of Water Induced by Wind. I. Langmuir 1541
Stream Flow. G. Nebbia 1819
Transverse Waves in Canals. B. R. Seth 1820
Decay of Circular Waves on Water. J. Baurand 1821
Force on an Elliptic Cylinder Moving in a Liquid Endowed with Uniform Vorticity. Y. Tasiro 1822
Motion of an Elliptic Cylinder in a Converging Stream. S. Oka 1823
Practical Application of the Analogy between Supersonic Flow in Gases and Supercritical Flow in Open Channels. T. v. Kármán 1824
Motion of a Fluid Heated from Below. R. J. Schmidt and O. A. Saunders 2072
H.F. Longitudinal Waves in Viscous Fluids. R. Lucas 2090
Energy and Motion of Transverse Waves in Liquids. A. D. Fokker 2091
Motion of Two Infinite Circular Cylinders in Rotating Fluids. M. Ray 2262
Simple Derivation of Stresses in a Moving Fluid. R. N. Ghosh 2263
Method of Establishing the Equations of Hydrodynamics. G. Dedebant, M. Kiveliovitch and P. Wehrle 2264
Criterion for Occurrence of Alternating Vortices and Relaxation Oscillations. M. Teissié-Solier and L. Castagnetto 2265
Moment of Fluid Forces Acting on Plate Gliding on Surface of Stream. A. E. Green 2266
Velocity and Temperature Distributions in Plane and Axially Symmetrical Jets. L. Howarth 2267
Secondary Flow Due to a Sphere Rotating in a Viscous Fluid. W. G. Bickley 2268
Lift and Moment on a Flat Plate in a Stream of Finite Width. T. H. Havelock 2269
Flow of Viscous Substances. W. Philippoff 2658
Distribution of Laminar Skin Friction on a Sphere Placed in a Uniform Stream. S. Tomotika and I. Imai 2699
Turbulent Velocity Distribution. J. J. Sommer 2700
Slow Movements of a Compressible Fluid. C. Jacob 3076
Rigid Configurations of Vortical Filaments Perpendicular to a Plane. L. Sona 3077
Hydrodynamic Sources. U. Cisotti 3078
Steady Two-Dimensional Motion of a Viscous Fluid Past a Fixed Circular Cylinder. B. A. Griffith 3079
Waves on Water of Finite Depth Due to Disturbance on the Surface. Y. Nomura 3080
Lift and Drag Functions for an Elastic Fluid in Two-Dimensional Irrotational Motion. H. Bateman 3081
Indeterminacy of the Stream Impulse in a Fluid of Infinite Extent. W. Tollmien 3082
Measurements of Turbulent Fluctuations. H. Reichardt 3083
Ocean Waves. K. Hidaka 3165
Forced Convection with Laminar Flow. G. Ribaud 3302
Propagation of Hydraulic Waves. G. Krall 3509
Equations of Probable Values of Turbulent Fluids. G. Dedebant and P. Wehrle 3510
Velocity and Temperature Distributions in the Turbulent Wake behind a Heated Body of Revolution. A. A. Hall and G. S. Hislop 3511
Velocity and Temperature Distributions behind a Heated Body of Revolution. S. Goldstein 3512
Stability of a Viscous Liquid between Rotating Coaxial Cylinders. J. L. Synge 3513
Non-Stationary Free Convection. D. A. Frank-Kameneckij 3764
Temperature Distribution in Reaction Vessel and Stationary Theory of Thermal Explosions. D. A. Frank-Kameneckij 3765
Influence of Vortices upon the Resistance of a Circular Cylinder Moving through a Fluid. S. Tomotika and N. Sugawara 3929
Pressure Dependent upon Vortex Formation. A. Donoff 3930
Conical Motion of Ideal Gas in the Case of a Sudden Increase of its Density (Boosemann's Problem). B. Boolinsky 3931
Chambers for Reducing Pressure Oscillations in Pipes. I. Tcharnyi 3932
Secondary Flow in Straight Pipes. L. Howarth 3933
Fluid Movements Giving a Succession of Applicable Surfaces. H. Pailloux 3934
Dispersion of a Turbulent Air Current and the Flow of Underground Water. K. Kitagawa 3935
Structural Mechanics of Viscous Elastic Continua. Part II. H. Umstätter 3936
Theory of Turbulence. C. Ferrari 4328

For the **Key** to this Index see pp. 1182 to 1194.

Hydrodynamics and Aerodynamics, *continued*.

Abstract Nos.

Mean Value of Fluctuations in Pressure and Pressure-Gradient in a Turbulent Fluid. A. E. Green 4782
Oscillatory Motion of a Fluid along a Circular Tube. D. G. Christopherson, A. Gemant, A. H. A. Hogg and R. V. Southwell 4783
Liquid Flow in Tubes and Suction Pumps. G. Heinrich 4803

3. Measurement of Fluid Flow.

Resistance to Flow of a Gas in a Smooth Circular Pipe of Constant Cross-Section. V. Lelchuk 458
Velocity Fluctuations in a Boundary Layer before and after Transition to Turbulent Motion. G. Broersma 459
Approximate Calculation of the Contraction Coefficient of a Gas Jet. C. Jacob 957
Initial Flow of a Viscous Fluid. H. Poncin 1000
Experimental Investigations of the Hydrodynamics of a Sphere. W. Möller 1435
Efflux Phenomena Occurring at Sharp-Edged Orifices. D. Pavel 1825
Free Discharge of Liquids from Capillary Tubes. A. Grumbach 1873
Turbulent Flow of a Fluid in a Straight Pipe of Annular Cross-Section. V. Mikrjukov 2270
Influence of Wall Oscillations, Wall Rotation and Entry Eddies on the Breakdown of Laminar Flow in an Annular Pipe. A. Fage 2271
Venturi Measurements. L. Ferroglio 2701
Measurements with a Half-Pitot Tube. G. I. Taylor 2702
Experimental Realisation of Solid Boundaries Free from Limiting Layer. A. Toussaint and M. Gdaliahu 3514
New Method for the Measurement of Gas Flow. R. Duchêne 3937
Sensitivity of Immersed Venturi-Pitot Heat at Low Speeds. C. Salter 3938
Use of a Vertical Pipe as an Overflow for a Large Tank. A. M. Binnie 4329
Thermal Effects on Bodies in an Air Stream. W. F. Hilton 4578
Differential Pneumatic Micrometer. G. Ribaud 4787

5. Unclassified.

Constant Velocity of a Falling Sphere. N. Frössling 53
Supersonic Waves in Gases. D. Riabouchinsky 801
Inclined Liquid Jet. J. Satterly and G. W. C. Tait 1436
Analogous Realisations of Flow with Discharge Lines. J. Pérès and L. Malavard 1437
Seepage of Water from an Open Channel into Deep Soil. G. Hamel 1543
Liquid Jets at Supersonic Velocities. R. Kling and N. Manson 2272
Transport of Ions in Gas at Supersonic Velocity. V. Volkovisky 2452
Trajectory of Ash Particles in Air and the Determination of their Size. K. Prosad and D. N. Sen 2666
Hydraulic Régime when a Solid is Translated through a Viscous Liquid. R. Serville 3515
Pressure Losses for Fluid Flow in 90° Pipe Bends. K. H. Beij 3516
Hydrodynamical Theory of Detonation. H. Langweiler 4591

Effect of Yaw on Vane Anemometers. R. H. Heald and P. S. Ballif 79B
Gradient Diagram. H. W. Gardner 1100B
Thermoelectric Probe for Measuring Gas Velocity. A. Sellerio 1550B

Hydrosphere, Physics of the.

1. Thermal Data.
2. Optical Data.
3. Ocean Tides and Currents.
4. Inland Lakes. Rivers.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

1. Thermal Data.

Tidal Variations of Temperature in the Irish Sea. J. Proudman 2785
Temperature of Surface Water of Western North Atlantic. G. Slocum 3164

2. Optical Data.

Light in the Sea. A. Puppo 1075
Calculation of Absorption Coefficients of Daylight in Natural Waters. R. T. Young, Jr. 1929

Hydrosphere, Physics of the, *continued.*

Abstract Nos.

Submarine Photometer for Studying the Distribution of Daylight in the Sea. C. L. Utterback and P. M. Higgs ... 1930

3. Ocean Tides and Currents.

Energy of the Secondary Undulations of Oceanic Tides in a Bay. M. Nakano 546
Free Oscillations of Water in a Basin with Smooth Boundaries. K. Hidaka .. 547
Marine Current Meter. M. Tenani ... 1076
Prevalent Periods of Oscillations in Tidal Waves. K. Sezawa and K. Kanai .. 1077
Tidal Observations. J. E. Fjeldstad ... 1539
Non-Homogeneity of Gradient Currents. T. Gustafson ... 2351
Work of Drifting North Polar Station. P. Shirshov and E. Fedorov ... 2352
Fluctuations in Yearly Mean Sea Levels. K. Muto and N. Miyabe ... 2786
Density Currents in Connection with the Problem of Submarine Canyons. P. H. Kuenen ... 2787
Dynamical Oceanography. G. F. McEwen ... 3603
Oceanographic Current Recorder. H. Dahl and O. Dahl ... 4019
Drift of Ice-Fields. W. W. Shoulejkin ... 4020
Periodic Oscillations of Annual Mean Sea-Level and Their Relations with Climate. J. Legrand ... 4419
Effect of a Travelling Atmospheric Disturbance upon the Sea Surface. T. Takegami ... 4420
Tides in Oceans Bounded by Meridians. Part III. A. T. Doodson ... 4421

4. Inland Lakes. Rivers.

Seiches in a Strait Connecting Two Seas. G. R. Goldsbrough ... 114
Abnormal Thermal Stratification of Inland Lakes. S. Yoshimura ... 548

6. Unclassified.

Total Amount of Sedimentation in the Deep Sea. P. H. Kuenen ... 115
Spectrographic Research on Elements Existing as Traces in Sea Water. J. Bardet, A. Tchakirian and R. Lagrange ... 1540
Surface Motion of Water Induced by Wind. I. Langmuir ... 1541
Magnetic Survey of the Oceans. J. A. Fleming ... 1566
Sea Disturbance. G. Weinblum ... 2788
Ocean Waves. K. Hidaka ... 3165
Marine Surveying. G. T. Rudé ... 3166
Earthquakes and Seismic Methods in Submarine Geology. N. H. Heck ... 3183
Terrestrial Magnetism and Oceanic Structure. J. A. Fleming ... 3185
Horizontal Mixing of Water Masses of the Caspian Sea. W. Stockmann ... 4021
Ra and Rn Content of Pacific Ocean Water, Life, and Sediments. Robley D. Evans, A. F. Kip and E. G. Moberg ... 4422
Internal Structure of the Globe; Origin of Continents and Oceans. A. Dauvillier ... 4423
Radium Content of Marine Sediments. Robley D. Evans and A. F. Kip ... 4852

Interference, Diffraction and Scattering (Radiation).

1. Interference Effects.
2. Interference, Applications.
3. Diffraction.
4. Scattering.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References:
Compton Effect, *see* X-Rays.
Electric Waves, *see* Oscillations and Waves, Electric.
Meteorological Optics (Corona, Halo, etc.), *see* Meteorology.
Raman Effect, *see* Spectroscopy.

1. Interference Effects.

Intense Lighting and Interference System. F. Zernike ... 655
Non-Ideal Lloyd's Mirror in Wide-Angle Interference. F. W. Doermann .. 1606
Production and Properties of Wide-Angle Optical Interference Phenomena. P. Selényi ... 1994
Light Signals Sent around a Closed Path. H. E. Ives ... 3964
Distribution of Intensity in Interference Fringes. J. Roig ... 4095
Interference of Light from Canal Rays. H. Billing ... 4202
Photographic Photometry of Interference Fringes. J. Roig ... 4915

For the **Key** to this Index see pp. 1182 to 1194.

Interference, Diffraction and Scattering (Radiation), *continued.*

2. Interference, Applications.

Abstract Nos.
New Experiments on Infra-Red Photography. M. Czerny and P. Mollet 1163
Optical Determination of Composition of Mixtures of Vapours and Air. W. Kinder 1607
New Method for the Measurement of Gas Flow. R. Duchêne 3937
Interferometric Wave-Length Comparison of the Red Cadmium Radiation Emitted by Different Sources. W. E. Williams and D. V. Gogate 4116
Observation of Diffusion Layer in Electrodeposition. H. J. Antweiler 4661

3. Diffraction.

Periodicities in Images of Ultrasonic Waves. E. Hiedemann and E. Schreuer 277
Interference Phenomenon with Supersonic Waves. E. Schreuer and K. Osterhammel 278
Diffraction by a Body of Revolution Illuminated by a Point Source on the Axis. Part II. P. Barreca 656
Improved Diffraction Patterns. M. E. Hufford 657
Diffraction of Light by Ripples on Liquid Surfaces. Part I. D. S. Subbaramaiya 1151
Zernicke's Phase Constrast Experiment. J. Picht 1152
Shadow of a Straight Edge. E. T. Hanson 1153
Effect of Width of Slit on Fraunhofer's Diffraction Phenomenon. D. Onoyama 1608
Diffraction, Mach Effect and Supplementary Fringe. F. Wolfers 1995
Microscopic Examination of Gratings with Periodic Ruling Faults. H. Siedentopf 1996
Velocity of Sound in Liquid Nitrogen. E. Hirschlaff 2531
Wave Phenomena in Models Using Supersonic Waves. S. Kretschmer and S. Rshevkin 2532
Supersonic Waves in Liquids under Pressure. P. Biquard 2533
Diffraction of Light by Supersonic Waves in Solids. N. S. N. Nath 2534
Absorption of Supersonics in Liquids by an Optical Method. H. Grobe 2535
Diffraction of Light by Supersonic Waves in Solids. E. Hiedemann 2536
Microscopic Examination of Ruled Gratings with Periodic Ruling Faults. H. F. W. Siedentopf 2865
Determination of Elasto-Optical Constants with Supersonic Waves. H. Mueller 2960
Grating Theory. J. F. C. Patry 2961
Precision Method of High Absolute Accuracy for Determining the Velocity of Supersonic Waves in Liquids. N. Seifen 2962
Simultaneous Raman Diffraction with Several Supersonic Waves. L. Bergmann and E. Fues 3334
Dynamical Theory of the Space-Lattice Diffraction. Parts I and II. E. Fues 3335
Theory of Intensity Anomalies in Diffraction. U. Fano 3673
Concept of Degree of Coherence and its Application to Optical Problem. F. Zernike 3674
Supersonic Waves as Optical Shutter. O. Maercks 4182
Supersonic Interference Method of Measuring the Velocity of Sound. J. P. Cance 4183
Diffraction of Converging Light Waves. I. Fränz-Gotthold and M. v. Laue .. 4484
Diffraction of Light by Superposed Supersonic Waves. M. A. G. Rau 4610
Diffraction of Light by Supersonic Waves. K. N. Rao 4611
Diffraction by Irregular Gratings. R. W. Ditchburn 4916

4. Scattering.

Applicability of the Mie Effect for the Determination of Particle Size in Aerosols. H. Engelhard and H. Friess 21
Observations of a Searchlight Beam to an Altitude of 28 Km. E. O. Hulbert 125
Reflectivity of Corrugated Surfaces. L. S. Ornstein and A. van der Berg .. 192
Double Scattering of Polarised X-Rays. P. Kirkpatrick 671
Absorption and Scattering of Light in Hydrophobic Colloids. Part II. F. B. Gribnau 913
Classical Optics. E. Buchwald 1170

Interference, Diffraction and Scattering (Radiation), *continued.*

Abstract Nos.
Light-Scattering and Allied Properties of H_2O and D_2O. S. Bhagavantam and B. S. R. Rao 1609
Structure of the Rayleigh Scattering in Liquids. K. Birus 1610
Scattering of Light by Crystals. E. Gross 1611
Depolarisation of Light Scattered in Solutions of Electrolytes. K. Hogrebe 1622
Reciprocity Theorem in Colloid Optics. R. S. Krishnan 1623
Absorption and Scattering of Light in Hydrophobic Colloids. Part III. F. B. Gribnau 1771
Reciprocity Theorem in Colloid Optics. R. S. Krishnan 2009
Light-Scattering in Emulsions. Part I. R. S. Krishnan 2010
Rayleigh Scattering in Liquids. P. Peyrot 2866
Scattering of Light. H. Mueller 2867
Anomalous Depolarisation of the Light Scattered by Binary Mixtures. B. K. Mookerjee 2873
Passage of Very High Energy Particles through Atomic Muclei. W. Heisenberg 2999
Dispersion of Depolarisation of Light-Scattering in Colloids. R. S. Krishnan .. 3444
Molecular Aggregation and Light Scattering. R. S. Krishnan 3445
Scattering of Light by Particles in the Air. H. Grisollet 3622
Molecular Diffusion of Light by Liquids. Variation of Diffusion Intensity with Wave Length. A. Rousset and R. Garnier 3675
Recent Work in Infra-Red. F. Matossi 4562

6. Unclassified.

Nature of Elementary Light Sources and Interference Phenomena. S. I. Wawilow 1133
Origin of the Brilliant Colours of Scaleless Beetles. J. P. Mathieu and N. Faraggi 3217
Theory of Caustic Curves. J. Coulomb 3218

Kinetic Theory of Matter.

1. Theory:
   (*a*) Gases.
   (*b*) Liquids.
   (*c*) Solids.
2. Radiometer Effect.
3. Atomic and Molecular Rays.
4. Brownian Motion.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References:
Photophoresis, *see* Emission (Radiation).
P.V.T. Relations, *see* Thermodynamics.

1. Theory.

(*a*) *Gases.*

Experimental Development of Thermal Diffusion. T. L. Ibbs 42
Influence of Magnetic Fields on the Heat Conductivity of Gases. Part IV. H. Senftleben and J. Pietzner 244
Quantum Theory of the Non-Ideal Gas. Part II. Behaviour at Low Temperatures. E. Beth and G. E. Uhlenbeck 258
Efflux of Gases through Orifices. B. V. Korvin-Kroukovsky 460
Distribution of Velocity in Turbulent Flow. J. J. Sommer 1432
Experimental Investigation of Thermo-Molecular Pressure Difference. S. Weber, W. H. Keesom and G. Schmidt 1438
Comparison of Results with Theory. S. Weber 1439
Experiments on the Thermo-Molecular Pressure Difference in the Region of the Boundary Condition $p_1/p_2 = \sqrt{T_1/T_2}$. S. Weber and G. Schmidt.... 1440
Equilibrium Conditions in Gases. S. Weber 1441
Thermal Conductivity of Gases. P. Guareschi 2499
Reflection Coefficient of Mercury. R. C. Mason 3697
Molecular Theory of Gases. Part II. M. Trautz 4994

(*b*) *Liquids.*

Kinetic Theory of Fluids. S. C. Bradford 54
Experiments with Models to Determine the Ordinal State of Molecules in Liquids and in Gases of High Density. H. Rehaag and H. A. Stuart .. 461
Suggested Explanation of Properties of Liquid He II. A. Michels, A. Bijl and J. de Boer 1235
Kinetic Theory of Monatomic Liquids. A. Harasima 1442
Molecular Potential Energy. P. Guareschi 1826
Molecular Heats of Liquids. P. Guareschi 1827

Kinetic Theory of Matter, *continued.*

Abstract Nos.

Osmosis. E. Ernst and J. Koczkás ... 3497
Kinetic Processes in Boundary Surfaces. K. Neumann ... 3517
Vibration of Molecules in Liquids and its Relation to Viscosity. D. B. MacLeod 3939
Free Volumes and Free Angle Ratios of Molecules in Liquids. J. F. Kincaid and H. Eyring ... 4330

(*c*) *Solids.*

Theory of Rotational Transformation. G. Hettner ... 2211
Coefficient of Compressibility of Solids. P. Guareschi ... 2257

3. Atomic and Molecular Rays.

Magnetic Spectrograph Calculations. F. T. Rogers, Jr. ... 296
Evidence for Halogen Films on Tungsten in the Surface Ionisation of Potassium Halides. J. O. Hendricks, T. E. Phipps and M. J. Copley ... 386
Scattering of Tl and Cd Atomic Rays at Oil Surfaces. G. Vészi ... 1443
Distribution of Water Vapour Issuing from a Capillary Tube. P. Renaud and G. Costeanu ... 1444
Excitation of Atomic Jets by Electronic Bombardment. R. Planiol ... 1704
Corpuscular Rays. Part II. A. Becker ... 2552
Velocity Distribution in an Atomic Stream and the Free Wave-Length as a Function of Velocity. N. Sasaki and M. Fukuda ... 3940
Determination of the Cross-Section of Metastable He Atoms with the Aid of Their "Photoelectric" Effect. R. Dorrestein and J. A. Smit ... 4331

4. Brownian Motion.

Theory of the Brownian Movement. N. Wassmuth ... 961
Effect of Polarised Light on the Brownian Movement. J. Kolb, A. Deubner, R. Fürth ... 1828
Velocity Measurements in the Brownian Movement of a Torsion Balance. E. Kappler ... 1829
New Light Source for Photographic Ultramicroscopy. K. Hoffmann ... 2216
Error in Statistical Series of Observations with Application to Brownian Motion of Torsion Balance. E. Kappler ... 2273
Influence of a Magnetic Field on Molecular Brownian Motion. C. Schaefer ... 2274
Relativistic Degenerate Gas and its Application to Brownian Motion. M. Sato 3518

6. Unclassified.

Forces Acting between Atoms and Ions and Physical Properties of Matter in Bulk. J. A. Wasastjerna ... 1786

Land, Physics of the

1. Earth's Interior.
2. Thermal Phenomena.
3. Physical Properties of Rocks.
4. Soil Physics.
5. Earth Tides.
6. Apparatus, *see* Supplementary Index.
7. Unclassified.
Cross-References :
Isostasy, *see* Gravitation.
Lakes, Rivers, Seiches, *see* Hydrosphere, Physics of the.

1. Earth's Interior.

Earth's Interior as Inferred from Terrestrial Magnetism. A. G. McNish ... 549
Strength of the Earth's Outer Shells. R. A. Daly ... 2789
New Theory of Earth's Core. J. Lynch ... 3167
Terrestrial Magnetism and Oceanic Structure. J. A. Fleming ... 3185
Magnetic Anomalies and Subterranean Structure. T. Nagata ... 4022
Gravity Anomalies and Subterranean Mass Distributions. C. Tsuboi ... 4023
Gravity Anomalies and Subterranean Mass Distribution. Part II. C. Tsuboi and T. Fuchida ... 4024
Structure of the Earth. S. v. Bubnoff ... 4025
Structure of the Earth as Revealed by Seismology. E. A. Hodgson ... 4026
Internal Structure of the Globe; Origin of Continents and Oceans. A. Dauvillier ... 4423
Magnetic Anomalies and Subterranean Mass Distribution. T. Nagata ... 4853

Land, Physics of the, *continued.*

2. Thermal Phenomena.

Abstract Nos.
Disturbance of the Temperature Gradient in the Earth's Crust by Inequalities of Height. H. Jeffreys 550
Disturbance of Temperature Gradient in the Earth Crust by Inequalities of Height. E. C. Bullard 2353
Gravitational Stability of the Earth at its Liquid Cooling Stage. K. Sezawa and K. Kanai 4027
Effect of Cooling on a Plastic Earth under Gravitational Forces. K. Sezawa and K. Kanai 4028
Effect of Cooling on a Plastic Earth under Gravitational Forces. Part II. K. Sezawa and K. Kanai 4854

3. Physical Properties of Rocks.

Demagnetising Action of Changes in Earth's Magnetic Field. H. Schmidlin 1107
Determination of Radium Content of Rocks by Direct α-Ray Counting. J. H. J. Poole 1122
Dielectric Constant of Metallic Suspensions and the Measurement of Ore Content. H. Löwy and M. M. Ghali 1928
Dynamical Model for Elastic and Plastic Strains in Stones. R. H. Evans 2790
Natural Residual Magnetism of Eruptive Rocks. Part I. J. G. Koenigsberger 3168
Theory of Plastic Buckling with its Application to Geophysics. P. P. Bijlaard 3604
Ground Movement in Mines. H. P. Greenwald 4029
Stability of Magnetic Thermoremanence in Baked Clay and Stones. J. G. Koenigsberger 4424
Natural Residual Magnetism of Eruptive Rocks. Part II. J. G. Koenigsberger 4425
Magnetic Properties of Rocks. Part I. Y. Katô 4426

4. Soil Physics.

Flow of a Granular Mass. K. Takahasi 551
Soil Respiration. M. Diem 552
Formation of Periodic Ice Streaks during Soil Freezing. F. M. Šemiakin and P. F. Mikhalev 1542
Seepage of Water from an Open Channel into Deep Soil. G. Hamel 1543
Velocity of Elastic Waves in Sand. K. Iida 2354
E.H.F. Electrical Constants of Soil. M. K. Chakravarty and S. R. Khastgir 2355
Effect of Temperature on the Electrical Constants of Soil at Radio Frequencies. R. D. Joshi 2791
Dielectric Constant and Conductivity of Soil at High Radio Frequencies. S. S. Banerjee and R. D. Joshi 2792
Thermal Diffusivity of the Soil at Colombo Observatory. J. P. Andrews 2793
Clay. W. H. Bragg 3169
Dispersion of a Turbulent Air Current and the Flow of Underground Water. K. Kitagawa 3935
Normal to Tangential Viscosity Ratio and Poisson's Ratio in Soils. K. Iida 4030

5. Earth Tides.

Pendulum Oscillations under the Influence of Tidal and Atmospheric Forces. H. Lettau 545

7. Unclassified.

Size-Grading of Sand by Wind. R. A. Bagnold 116
Shape-Sorting of Sand Grains by Wind Action. G. R. MacCarthy and J. W. Huddle 553
Tectonic Problems in the Light of Modern Knowledge. I. Ruud 1544
Continental Drift. P. Sconzo 1931
Wegener's Theory of Continental Drift. H. V. Gill 1932
Measurement of Sand Storms. R. A. Bagnold 3605
Grain Structure and Water Content of Sand Dunes. R. A. Bagnold 4031

Latitude and Longitude.

See also Geodesy.

Abstract Nos.

Horizontal Pendulum Movements in Relation to Latitude Variation. F. N. Denison 1020
Determination of Longitude by the Azimuth of the Moon. K. Lous 1505
Change of Plumb Line Referred to the Axis of the Earth from International Latitude Observations (Second Paper). E. Nisimura 1506
Annual Change in Longitude. F. Schlesinger 1507
Azimuth Variation of the Meridian at Strasburg Observatory. J. Xanthakis 1508
New Observing Programme for the International Latitude Service. H. Kimura 2322
Determination of the Constants of Nutation from the Greenwich Latitude Variation Observations. H. Spencer Jones 2756
Theodolite Fitted with a Shutter Eyepiece. J. de G. Hunter 2783
Programme Selection in Transit Observations. J. Schive 3125
Astronomy in Navigation. G. W. Mixter 3990
Variations of Latitude. L. Carnera 4384

Length, Area and Volume.

1. Standards.
2. Measurements.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-Reference :
Units, *see* Mathematical Methods, etc.

2. Measurements.

Dimensional Changes in Aerial Photographic Films and Papers. R. Davis and E. J. Stovall 180
Rapid Calibration and Correction of Comparator Screws and Photographic Production of Scales. G. R. Harrison 962
Mechanical Amplification of Small Displacements. A. F. C. Pollard 1445
Magnetic Comparator Metal Thickness Tester. A. B. Stevenson 2275
Empirical Cosmology. P. Jordan 3579
Radii of Curvature. K. Giesebart 3941
Method of Ascertaining and Defining Fineness of Powder. I. Iitaka and R. Shiota 3942
Precision Measurements with the Micrometer Eyepiece. H. Rühle 4332
Deformation of Sensitive Levers. Berndt and W. Vogt 4784
Curved Rulers. F. Emde 4785
Calibration of Circular Scales from Eccentricity Measurements. W. Krug 4786

4. Unclassified.

Electrodynamic Volume and Porosity of Metallic Particles. H. Löwy 5044

Electrical Gauges in Measurement and Control. P. K. Hermann 92B
Elongation Measuring Apparatus. A. Thum, O. Svenson and H. Weiss 3426B

Magnetism and Electromagnetism.

1. Theory.
2. Ferromagnetism.
3. Diamagnetism and Paramagnetism.
4. Electromagnetic Field and Electrodynamics.
5. Electromagnetic Induction. Inductance.
6. Magneto-Mechanical Effects (Gyromagnetic Effect and Magnetostriction).
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References :
Current, Voltage and Resistance Measurement, *see* Conduction (Electric) in Solids and Liquids.

Cross-References (contd.) :
Earth's Magnetism, *see* Terrestrial Electricity and Magnetism.
Effect of Magnetic Field on Resistance, *see* Galvanomagnetic and Thermomagnetic Effects.
Inductive Networks, *see* Alternating-Current Networks.
Skin Effect, *see* Conduction (Electric) in Solids and Liquids.
Units, *see* Mathematical Methods, etc.

1. Theory.

Reciprocals to Ampère's Law. P. B. Carwile 877
Theory of Ferromagnetism. L. Oertel 1323
Electronic States of Divalent Metals. K. Ariyama 2127

Magnetism and Electromagnetism, *continued.*

Abstract Nos.

Application of General Cylindrical Functions in Electromagnetic Theory. S. S. Stefanescu 2165
Domain Theory of Ferromagnetics under Stress. Part II. W. F. Brown, Jr. 2166
Collective Electron Ferromagnetism. E. C. Stoner 2167
Principle of the Conservation of Electricity. A. Boutaric 2618
Magnetism and the Vibratory Electron. E. T. Jones 2619
Attempt at a Theory of the Nucleus. F. J. Wiśniewski 2650
Dirac Magnet Pole. P. Jordan 2716
Paramagnetic Magneton Numbers of the Ferromagnetic Metals. E. C. Stoner 3013
Stefan's Law and Non-Linear Electrodynamics. B. Kwal and J. Solomon 3210
Periodic Orbits in the Equatorial Plane of a Magnetic Dipole. C. Graef and S. Kusaka 3393
Electromagnetic Field in Special Relativity. J. Roubaud-Valette 3394
Paramagnetism of Electrons in a Rectangular Band. L. Néel 3395
Time of Relaxation Due to Spin-Spin Interaction in Paramagnetic Crystals. R. de L. Kronig and C. J. Bouwkamp 3396
Theory of Magnetic Anisotropy of Cubic Crystals at Absolute Zero. W. F. van Peype 3397
Generalisation of the Theory of Ferromagnetism. F. Bitter 3398
Domain Theory of Ferromagnetics under Stress. Part III. W. F. Brown, Jr. 3844
Phase of Magnetic Field. K. F. Niessen 4235
Symmetries of the Magnetic Field. E. Brylinski and A. Cotton 4688
Electricity as a Fluid. G. D. Birkhoff 4689

2. Ferromagnetism.

Magnetic Moment and Molecular Field of Ferromagnetics. L. Néel 350
Saturation Magnetisation and Approximation Law for Iron. W. Steinhaus, A. Kussmann and E. Schoen 351
Susceptibility in Nickel. D. Kirkham 352
Crystal Structure and Ferromagnetism of Alloys. U. Dehlinger 421
Properties of Ferromagnetic Substances in Powder Form. O. Sappa 878
Heisenberg's Theory of Ferromagnetism. T. Yamanouchi 879
Anisotropy of Cubic Ferromagnetic Crystals. J. H. van Vleck 880
Magnetic Hysteresis in Single Crystals. R. Jaanus and J. Schur 1324
Anisotropy of the Magnetic Energy in Single Crystals of Nickel as a Function of Temperature. N. L. Brukhatov and L. V. Kirensky 1325
H.F. Permeability of Thin Electrolytic Iron Layers. S. Procopiu and G. d'Albon 1326
Variation of Magnetisation Processes with Time in Weak Fields. H. Wittke.. 1327
Magnetic After-Effect. H. Wittke 1328
Ferromagnetic Curie Points of Rare-Earth Metals. L. Néel 1329
Air Permeance of Permanent Magnets. H. Lacoste-Tayan 1330
Initial Magnetisation. T. Kahan 1331
Effects of Fringing Flux in Large Magnets. J. D. Howe and I. Walerstein .. 1733
Gaussian Approximation in the Heisenberg Theory of Ferromagnetism when $S > \frac{1}{2}$. J. H. van Vleck 1734
Quantitative Measurements of Texture by the Magnetic Torque Method. L. P. Tarasov 1789
Domain Theory of Ferromagnetics under Stress. Part II. W. F. Brown, Jr. 2166
Susceptibility of Cerium. R. Jaanus 2168
Ferromagnetism and Structure of Manganese Ferrites. A. Kussmann and H. Nitka 2620
Applications of Intense and Extended Magnetic Fields in Recent Researches. A. Cotton 3014
Phenomena in Iron-Cored Circuits. W. S. Stuart and T. G. Bridgwood 3015
Magnetic After-Effects in Weak Alternating Fields. Parts I, II and III. H. Schulze 3016
Magnetic Binding. O. v. Auwers 3017
Magnetic and X-Ray Examination of Ni-Pt Alloys. A. Kussmann and H. Nitka 3018
Magnetic Structure of Co. W. C. Elmore 3019
Magnetic Properties of Ferric Hydroxide. R. Chevallier and S. Mathieu...... 3399
Moment of Cubic Single Crystals in a Magnetic Field. H. Mussmann and H. Schlechtweg 3400

For the **Key** to this Index see pp. 1182 to 1194.

Magnetism and Electromagnetism, *continued.*

Abstract Nos.
Domain Theory of Ferromagnetics under Stress. Part III. W. F. Brown, Jr. 3844
Magnetic Anisotropy in Ferromagnetic Crystals in Weak Fields. E. Kondorsky 3845
Magnetic Properties of Ferric Hydroxide. R. Chevallier and S. Mathieu 3846
Magnetic Susceptibility and Phase Diagram of Ni-Mo Alloys. G. Grube and O. Winkler 3847
Change of Thermal Energy with Adiabatic Change of Magnetisation in Iron, Nickel and Carbon Steel. T. C. Hardy and S. L. Quimby 3848
Magnetic Viscosity in Iron. C. W. Heaps 3849
Permanent-Magnet Alloys of Co, Cu and Ni. W. Dannöhl and H. Neumann 4236
Time Effects in Magnetisation. J. L. Snoek 4237
Magnetic Properties of Thin Evaporated Iron Layers. K. R. Dixit 4238
Magnetic Anisotropy in Ferromagnetic Crystals in Weak Fields. Parts II and III. E. Kondorsky 4239
Break in Magnetisation Curve of Iron Monocrystals in Weak Magnetic Fields. K. Honda and T. Nishina 4240
Anomaly of Magnetite at Low Temperatures. R. Forrer 4241
Effect of Pressure on the Curie Temperature. H. Ebert and A. Kussmann 4242
Ferromagnetic Gels. T. Katsurai and K. Yamasaki 4285
Magnetic Properties of Ni and Ni-Rich Alloys. T. Hirone 4690
Drift of Magnetic Permeability at Low Inductions after Demagnetisation. G. R. Patterson 4691
Velocity of Propagation of Electric Waves along Nickel Wires and Magnetic Permeability of Nickel for Hertzian Oscillations. K. F. Lindman 5074

3. Diamagnetism and Paramagnetism.

Resistance and Magnetic Susceptibility of D$_2$-Charged Palladium. A. Sieverts and W. Danz 307
Diamagnetic Susceptibilities of Complex Ions. S. R. Rao and S. Sriraman 353
Diamagnetic Anisotropy of Cyclic Molecules. J. Frenkel and V. Saveliev 881
Dia- and Paramagnetism in Metallic Mixed Crystals. Part V. Effect of Dissolved Cobalt and Rhodium. E. Hildebrand 882
Paramagnetic Measurements at Low Fields with the Rankine Balance. H. P. Iskenderian 883
Paramagnetic Dispersion in Iron Alum. F. Brons and C. J. Gorter 884
Magnetic Properties of Mercuri-Iodides. F. Gallais 885
Theory of Absorption and Dispersion in Paramagnetic Crystals under Alternating Magnetic Fields. R. de L. Kronig 1292
Magnetic Examination of Metallic Solutions of Na in NH$_3$. E. Huster and E. Vogt 1332
Adiabatic Demagnetisation of Cæsium Titanium Alum. J. H. van Vleck 1333
Diamagnetic and Paramagnetic Anisotropy of Crystals. K. Lonsdale 1334
Magnetic Anisotropy of Naturally Occurring Substances. Part III. Wood and its Constituents. P. Nilakantan 1735
Magnetic Anisotropy of Tutton Salts. M. S. Joglekar 1736
Resonance in Urea and its Derivatives. Part II. Diamagnetics of Thio-Derivatives. A. Clow 1737
Paramagnetism of the Iron Group. S. S. Bhatnagar, M. L. Khanna and M. B. Nevgi 1738
Temperature Variation of Electron Spin Paramagnetism : Numerical Results. E. C. Stoner 1739
Thermomagnetic Properties of Ag-Cd and Cu-Cd Systems. N. Perakis and L. Capatos 2164
Magnetic Properties of Tellurium on Colloidalisation. M. Prasad and S. S. Dharmatti 2169
Magnetic Properties and State of Ionisation of Atoms in Alloys. G. Foëx 2170
Free Radical of a New Type. Paramagnetism of the Perchlorate of Tritolylamménium. P. Rumpf and F. Trombe 2171
Diamagnetic Anisotropy of an Aromatic Molecule. C. F. Squire 2172
Diamagnetic Anisotropy of Conjugated Compounds. K. Lonsdale 2173
Diamagnetic Polarisabilities of the Benzene Molecule. H. König 2174
Magnetically Neutral Solutions. C. Salceanu 2175
Magne-Crystallic Action. Part V. Paramagnetic Salts of the Rare-Earth and Iron Groups. K. S. Krishnan and A. Mookherji 2176

Magnetism and Electromagnetism, *continued.*

Abstract Nos.

Purification and Magnetic Properties of Mercury. L. F. Bates and C. J. W. Baker 2177
Recent Advances in Magneto-Chemistry. S. S. Bhatnagar 2621
Recent Study of Dehydration of Crystallised Cupric Hydroxide. L. Chaumeton 2622
Paramagnetism of Organic Cupri-tetrachlorides and Cupri-trichlorides. J. Amiel 2623
Diamagnetic Susceptibility of Bismuth. M. Blackman 2624
Cooling by Adiabatic Demagnetisation. P. Debye 2935
Magnetic Properties of Small Metallic Specimens at Low Temperatures. F. Hund 3020
Crystallisation and Thermomagnetic Anomaly of Lepidocrocite. A. Michel and M. Gallissot 3021
Susceptibility of Liquid NO. H. Bizette and B. Tsaï 3022
Susceptibility of Paramagnetic Alums in Alternating Fields. M. Fierz 3023
Paramagnetic Conversion of Parahydrogen and Orthodeuterium in the Presence of Nitric Oxide and the Magnetic Moment of the Deuteron. L. Farkas and U. Garbatski 3024
Diamagnetism of Cadmium. S. R. Rao and S. Sriraman 3025
Magnetic Susceptibility of the Iron in Ferrohæmoglobin. D. S. Taylor and C. D. Coryell 3401
Atomic Moment of Tetravalent Rhenium. N. Perakis, T. Karantassis and L. Capatos 3402
Paramagnetic Dispersion with Different Orientations between H.F. and Constant Fields. P. Teunissen and C. J. Gorter 3403
Magnetic Behaviour of Diamagnetic Salts at Lattice Change Points. G. E. R. Schulze 3850
Accurate Measurements of Magnetic Susceptibilities of Rare Earths by the Faraday Method. B. Cabrera 3851
Potentiometric and Magnetometric Study of the Duroquinone System. L. Michaelis, M. P. Schubert, R. K. Reber, J. A. Kuck and S. Granick 3852
Magnetic Susceptibilities of Inorganic Complex Compounds. J. H. Frazer and N. O. Long 3853
Paramagnetic Relaxation in Iron Ammonium Alum at Low Temperatures. W. J. de Haas and F. K. du Pré 3854
Thermodynamic Interpretation of Paramagnetic Relaxation Phenomena. H. B. G. Casimir and F. K. du Pré 3855
Paramagnetism of the Ferromagnetic Elements. W. Sucksmith and R. R. Pearce 3856
Principal Paramagnetic Susceptibilities of Potassium Ferricyanide at Low Temperatures. L. C. Jackson 3857
Magnetic Properties and Structure of Manganous and Cobaltous Dipyridine Chlorides. D. P. Mellor and C. D. Coryell 3887
Magnetically Orientated Bismuth. A. Altma 4243
Paramagnetic Dispersion in Chromium Alum and Its Interpretation. C. J. Gorter, P. Teunissen and F. Brons 4244
Magnetic Studies on Rhodochrosite, $MnCO_3$. K. S. Krishnan and S. Banerjee 4245
Magnetic Susceptibility of Au-Cu, Au-Ag, Ag-Cu and Cu-Ni Alloys. W. Broniewski, S. Franczak and R. Witkowski 4246
State of Ni in the α-Phase of Ni-Zn System. J. Dorfman and S. Sidorof 4247
Magnetic Susceptibility of Sm^{+++} Between 293 and 800° K. O. E. Frivold and L. Lunde 4248
Paramagnetic Relaxation. P. Debye 4249
Magnetic Anisotropy and Structure of $CuSO_4 \cdot 5H_2O$. Part II. K. S. Krishnan and A. Mookherji 4311
Theory of Magnetic Neutral Solutions. New Possibility of Determining Magneton Values. O. v. Auwers 4692
Magnetic Anisotropy and Pleochroism of Biotite Mica. P. Nilakantan 4693
Transition Point of Magnetic Susceptibility of MnO. H. Bizette, C. F. Squire and B. Tsaï 4694
Magnetic Properties of Anhydrous Nickel Chloride and the Laws of Variation of Paramagnetism. P. Laurent 4695
Magnetism and Molecular Constitution of Chromium Compounds. S. S. Bhatnagar, B. Prakash, and A. Hamid 4696
Paramagnetism of Mn. A. Serres. 5059

For the **Key** to this Index see pp. 1182 to 1194.

Magnetism and Electromagnetism, *continued.*

Abstract Nos.

Paramagnetic Dispersion in a Single Crystal. P. Teunissen and C. J. Gorter 5060
Suitability of Diamagnetic Crystal for Magnetic Field Measurement. R. G. Stansfield 5061

4. Electromagnetic Field and Electrodynamics.

Influence of Magnetic Fields on the Heat Conductivity of Gases. Part IV. H. Senftleben and J. Pietzner 244
Magnetic Field of a Symmetrical Bundle of Parallel Wires Carrying Equal Currents. C. G. Dunn and G. L. Clark 354
X-Ray and Magnetic Analyses of Deformed Silicon Steel Rings. G. L. Clark and C. G. Dunn 355
Method of Images for Calculating Electric and Magnetic Fields. E. A. Meyerovitz 886
Electrodynamics of Ponderable Bodies. J. C. Slater 1470
The Electron and Limits to the Precision of Electromagnetic Field Specifications. W. H. Watson 1740
Indeterminacy of the Electromagnetic Potentials. B. Kwal 1741
Invariant Form of the Maxwell-Lorentz Field Equations for Accelerated Systems. G. Kron 1851
Equations of Electromagnetism. Part I. Identifications. Part II. Field Theory. E. A. Milne 2178
Interaction Energy in Electrodynamics and in the Field-Theory of Nuclear Forces. E. C. G. Stueckelberg 2710
Use of Potential in Born's Electrodynamics. Z. Chrapływy 3026
Physical Basis of Some Metallurgical Problems. W. Gerlach 3404
Operational Solution of the Wave Equation. L. A. Pipes 3947
Wave-Motion for Infinite Domains. A. N. Lowan 3948
Equations of Motion of a Charged Particle in an Electromagnetic Field. T. Boggio 4679

5. Electromagnetic Induction. Inductance.

Simplification of Maxwell's Equations in Conformity with the Flux-Cutting Principle. C. V. Drysdale 1335
Primary Standard of Mutual Inductance of the National Physical Laboratory. N. F. Astbury 1336
Electromagnetic Method of Determining Induction-Coefficients of Magnetometer Magnets. J. H. Nelson 3405
Mutual Shunt Method of Measuring Self Inductance at Radio Frequencies. A. Campbell 3796
Magnetometer of Rogowski. G. Giorgi 4697
Limiting Sensitivity of an A.C. Method of Measuring Small Magnetic Moments. E. A. Johnson 4698
Currents to Conductors Induced by a Moving Point Charge. W. Shockley 4699
Determination of Absolute Ohm, Using an Improved Self Inductor. H. L. Curtis, C. Moon and C. M. Sparks 5031

6. Magneto-Mechanical Effects (Gyromagnetic Effect and Magnetostriction).

Influence of Pressure on the Curie Point of Ni-Cu Alloy. A. Michels, A. Jaspers, J. de Boer and J. Strijland 356
Adiabatic Magnetostriction of Liquid Oxygen. M. Wolfke 1337
Modulus of Elasticity of Ferromagnetic Substances in Dependence on the Temperature and on the Magnetic Field. O. Engler 1338
Improved Magnetostriction Oscillator. G. W. Pierce and A. Noyes, Jr. 1699
Magnetic Interaction in Homogeneously Strained Ferromagnetic Crystals. L. W. McKeehan 1742
Magnetic Interaction in Pyrrhotite and in Magnetite. L. W. McKeehan 1743
Growth of Nuclei of Magnetisation at Large Barkhausen Discontinuities. W. Döring 1744
Magnetostriction of Ferromagnetic Substances due to Quadripole Forces. T. Hirone 2179
Influence of a Transverse Magnetic Field on the Thermoelectric Power of Nickel and Fe-Ni Alloys under Stress. G. Simon and J. Bouchard 2201
Further Measurements of the Magnetostriction of Liquid Oxygen. M. Wolfke 3858

For the **Key** to this Index see pp. 1182 to 1194.

Magnetism and Electromagnetism, *continued.*

Abstract Nos.

Effect of Temperature on Elastic Modulus of Ferromagnetic Substances. W. Döring 3859
Gyromagnetic Effect in Supraconductors. I. K. Kikoin and S. V. Goobar .. 3860
Change of Young's Modulus of Elasticity by Magnetisation in Iron and Carbon Steels. M. Yamamoto 4700

8. Unclassified.

Effect of Magnetic Field on Viscosity of Gases. H. Senftleben and H. Gladisch 502
Effect of Magnetic Fields on the Thermal Conductivity of Gases. E. Rieger .. 2068
Influence of a Magnetic Field on the Absorption of Sound in Oxygen. A. van Itterbeek and L. Thys 2106
Clean-Up of Inert Gases in an Electric Discharge. Parts II and III. H. Alterthum and A. Lompe 2555

Precise Measurements of Electromagnetic Fields. H. G. Smith 742B
Bridge Connections with Semiconducting Resistances. E. Weise 757B
Maxwell-Lagrange Equations and their Application to the Theory of Models and the Theory of the Free Electron. G. Jochmans and F. Descans .. 782B
Magnetic Properties of Ni-Cu-Fe Alloys. 791B
Magnetic Anisotropy in Sheet Steel. W. E. Ingerson and F. J. Beck, Jr. .. 792B
Calculation and Testing of Electromagnet with Constant Pull over a Large Travel. C. A. Traenkle 793B
Design of Mutual Inductances. H. H. Wicht 797B
Variation in H.F. Resistance and Permeability of Ferromagnetic Materials Due to a Superimposed Magnetic Field. J. S. Webb 1839B
Magnetic Dispersion of Parallel Conductors between Screens of Infinite Permeability. J. Kučera 1875B
Magnetic Filings in Suspension. A. Guilbert 2419B
Rheographic and Rheometric Analogies. J. Pérès and L. Malavard 2614B
Law of Reaction in Electrodynamics. M. Wolfke 2617B
Permanent Magnets. G. Venco 2659B
Parameters of Surface Orthogonal to Eddying Magnetic Fields. T. Lehmann 3428B
Design of Large Electromagnets. L. Dreyfus 3434B

Mass.

1. Standards.
2. Measurements.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-Reference :
Units, *see* Mathematical Methods, etc.

Mathematical Methods and Theory of Measurements.

1. Mathematical Methods.
2. Theory of Measurements, Probability and Errors.
3. Units and Dimensions.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

1. Mathematical Methods.

Validity of Methods in Nuclear Calculations. D. T. Warren and H. Margenau 2
Fourier Expansions Obtained Operationally. N. W. McLachlan 56
Operational Representations of Products of Parabolic Cylinder Functions and Products of Laguerre Polynomials. W. T. Howell 57
Table of Catenary Elements. F. P. Witmer 60
Expressions for First Partial Derivatives of Thermodynamic Functions. F. Lerman 262
Calculation of Interplanar Spacings of Crystal Systems by Vectors. S. S. Sidhu 416
Differentiation of Line Integrals by Parallel Displacement. W. S. Kimball 463
New Approach to Study of Terrestrial Solar Relationships. J. W. Mauchly 582
Method of Images for Calculating Electric and Magnetic Fields. E. A. Meyerovitz 886
Differential Equation of Ultracentrifuging. S. Oka 923
Relaxation Methods Applied to Engineering Problems. Part II. Basic Theory, with Applications to Surveying and to Electrical Networks and an Extension to Gyrostatic Systems. A. N. Black and R. V. Southwell 946

Mathematical Methods and Theory of Measurements, *continued.*

Abstract Nos.
Radiation Integrals $\int_x^\infty dx/x^a(e^x-1)$. J. R. Airey ... 964
Different Forms of an Action Function Expressed by Means of Complex Variables. M. A. Tonnelat-Baudot ... 982
Operational Representation of Discontinuous Functions. L. A. Pipes ... 1265
Solutions of the Laminar Boundary Layer Equations. L. Howarth ... 1430
Log π and Other Basic Constants. H. S. Uhler ... 1447
Analysis of Oscillations. F. Vercelli ... 1448
New Operational Method in Mathematical Physics. T. Sakurai ... 1449
Matrix-Operational Methods in Mechanical Vibrations. L. A. Pipes ... 1450
Operational Representation of M-Functions of the Confluent Hypergeometric Type. S. C. Dhar ... 1451
Whittaker's Confluent Hypergeometric Function. J. L. Sharma ... 1452
Integral Representations for Products of Weber's Parabolic Cylinder Functions. W. T. Howell ... 1453
Fractional Differentials. A. Gemant ... 1454
Inverse Problem of Potential. P. Novikoff ... 1457
Whittaker's Solution of the Equation of Wave Motion. S. Syôno ... 1830
Hermite Polynomials. W. T. Howell ... 1831
Application of General Cylindrical Functions in Electromagnetic Theory. S. S. Stefanescu ... 2165
Densest Position of Homologous Bodies. H. Hancock ... 2235
Use of the Mader-Ott Harmonic Analyser. E. J. Nyström ... 2276
Approximations to Functions and to Solutions of Differential Equations. R. A. Frazer, W. P. Jones and S. W. Skan ... 2277
Operational and Matrix Methods in Linear and Variable Networks. L. A. Pipes ... 2541
Potentials in Curved Surfaces. G. R. Stibitz ... 2610
Numerical Solution of Laplace's Equation. G. H. Shortley and R. Weller 2703
Operational Theory of Solid Friction. L. A. Pipes ... 2748
Application of Fourier Analysis to Heat Flow in Complex Systems. P. Vernotte ... 2927
Complementary Heaviside Operator. T. Sakurai ... 3084
Non-Linear Partial Differential Equations of the Elliptic-Parabolic Type. M. R. Siddiqi ... 3085
Graphical Solution of Ordinary Differential Equations. V. A. Bailey and J. M. Somerville ... 3086
Application of Statistical Methods to Manufacturing Problems. W. A. Shewhart ... 3535
Diagrams of State for Moist Gases. A. Stradelli ... 3778
Method of Least Squares and Thermoelectric Power of Rhodium. H. T. Wensel, L. B. Tuckerman, E. T. Booth and E. H. Dixon ... 3881
Fundamental Theorem of the Calculus. K. Yosida ... 3945
Anomalous Case in Cauchy's Problem for the Wave Equation. E. Frola ... 3946
Operational Solution of the Wave Equation. L. A. Pipes ... 3947
Wave-Motion for Infinite Domains. A. N. Lowan ... 3948
Riemannian Tensors. V. V. Narlikar ... 3949
Operational Forms and Contour Integrals for Bessel Functions with Argument $a=\sqrt{t^2-b^2}$. N. W. McLachlan ... 3950
Generalised Fractional Integration and Differentiation. W. Fabian ... 3951
Complete Solution of Differential Equation for Confluent Hypergeometric Function. W. J. Archibald ... 3952
Centres and Foci. I. Koukles ... 3953
Kirchhoff Constraints and Sagittal Graphs. W. H. Ingram ... 4189
Operational Forms and Contour Integrals for Struve and other Functions. N. W. McLachlan ... 4335
Theory of Heat Conduction. H. S. Carslaw and J. C. Jaeger ... 4577
Calculation of Temperatures of Strongly Heated Rods and Wires. J. Fischer 4579
Relaxation Methods Applied to Engineering Problems. Part III. Problems Involving Two Independent Variables. D. G. Christopherson and R. V. Southwell ... 4776
Functions of Quaternions. V. C. A. Ferraro ... 4788
General Equation of Statistical Mechanics. B. Hostinský ... 4795
Spinor Calculus. T. Sibata ... 4804
Tables Facilitating Calculation of Line Absorption Coefficients. F. Hjerting 4843

For the **Key** to this Index see pp. 1182 to 1194.

Mathematical Methods and Theory of Measurements, *continued.*

2. Theory of Measurements, Probability and Errors.

Abstract Nos.

Correlation of Multidimensional Chance Variables. T. Lindblad 464
Fiducial Distribution of Several Parameters with Application to a Normal System. I. E. Segal 965
Significance Tests for Continuous Departures from Suggested Distributions of Chance. H. Jeffreys 966
Correction of Frequencies for a Known Standard Error of Observation. H. Jeffreys 1455
Statistical Analysis of the Rhythm of Latent Regularities in Depths. K. Brodovitskij 1456
Significance Tests when Several Degrees of Freedom Arise Simultaneously. H. Jeffreys 1832
Error in Statistical Series of Observations with Application to Brownian Motion of Torsion Balance. E. Kappler 2273
Use of Minimum χ^2 as Approximation to Method of Maximum Likelihood. H. Jeffreys 2278
Reduction of Scale Deflections in Radiometry. T. E. Sterne 2425
Law of Anomalous Numbers. F. Benford 2704
Law of Error and the Combination of Observations. H. Jeffreys 3087
Effect of Departures from Ideal Conditions other than Non-Normality on the *t* and *z* Tests of Significance. H. E. Daniels 3519
Fluctuations and the Shot Effect. E. N. Rowland 3520
Short Derivation of a Fundamental Probability Formula. L. Silberstein 3521
Comparison of Series of Measures on Different Hypotheses Concerning the Standard Errors. H. Jeffreys 3954
Posterior Probability Distributions of the Ordinary and Intra-Class Correlation Coefficients. H. Jeffreys 3955
Dimensionless Constants of Physics. A. E. Haas 3956
Logic and Probability in Physics. C. G. Darwin 3963
Measurement of Angles. C. Schmerber, P. Tardi and P. Caillol 4336
Use of Probability Paper. E. W. H. Selwyn 4337
Deformation of Sensitive Levers. Berndt and W. Vogt 4784
Method of Calculating Fluctuations. R. Ellickson 4789
Problem in Coin-Tosses. S. R. Savur 4790
Apparent Persistence of One Type of Weather. W. G. Cochran 4861

3. Units and Dimensions.

Units used by Various Authors in Chemical Physics and Physical Chemistry. K. Butkow 465
Limiting Effects of Consideration of Dimensions. E. Fues 967
Systems of Units. W. M. Hall 968
Units and Precautions in Radiology. E. P. Vanoni 1344
Fundamental Unit of Electric Charge. H. T. Flint and W. Wilson 2152
Unit of Foaminess. J. J. Bikerman 2311
M.K.S. Units in Electro-Acoustics. A. E. Kennelly and J. H. Cook 2539
Electromagnetic Units. F. Hund 2705
M.K.S. System of Units 2706
Most Probable Value of the Electronic Charge and other Related Constants for 1938. R. A. Millikan 2997
Natural Dimensions of Physical Quantities. E. H. Kennard 3088
Ratio of International Ohm to Absolute Ohm. R. Jouaust, M. Picard and R. Herou 3355
Dimensions in Continuum Physics. R. Fürth 3522
Empirical Cosmology. P. Jordan 3579
Most Probable Value of the Electronic Charge and other Related Constants for 1938. R. A. Millikan 3832
Coordination of Units of Measurement. M. Simonoff 4338

5. Unclassified.

Symmetry. H. Weyl 3090

Integrating Instruments. W. Meyer zur Capellen 1199B
Mechanical Construction of Special Curves. W. R. Crawford 1826B

For the **Key** to this Index see pp. 1182 to 1194.

Mathematical Methods and Theory of Measurements, *continued*.

Abstract Nos.
Matrix Solution of Polynomial Equations. L. A. Pipes 1828B
Solution of Differential Equations. G. Gentini 2395B
Free Vibrations in Systems with Several Degrees of Freedom. W. M. Dudley 2399B
Determinant of Certain Matrices. L. R. Walker 2400B
Notion of an Angle. E. Brylinski 3184B
Application of Fourier Integral. P. David 3386B

Mechanics, Classical.

1. Statics.
2. Dynamics.
3. Statistical Mechanics (Classical).
4. Apparatus, *see* Supplementary Index.
5. Unclassified.
Cross-References :
Acceleration due to Gravity, *see* Gravitation.
Cross-References (contd.) :
Astronomical Dynamics, *see* Dynamical Problems (Astronomical).
Elastic Vibrations, *see* Elasticity and Plasticity, *and* Acoustics.
Hydrodynamics and Aerodynamics, *see under*.
Kinetic Theory, *see* Kinetic Theory of Matter.

1. Statics.

Equilibrium of Convex Surfaces. F. Aimond 59
Table of Catenary Elements. F. P. Witmer 60
Inverse Problem of Potential. P. Novikoff 1457
Relations between Energy Theorems Applicable in Structural Theory. D. Williams 4792

2. Dynamics.

Matrix-Operational Methods in Mechanical Vibrations. L. A. Pipes 1450
Definition of Stability-Probability. V. Stepanoff 1458
Stable Dynamical Systems in the Sense of Liapounoff. M. Beboutoff 1459
Stability of Motion in First Approximation. I. Malkin..................... 1460
Gyroscopic Movement of Projectiles. R. d'Adhémar....................... 1461
Velocity of Rebound and Energy Absorbed in Impact of a Hard Striker on a Soft Metal. L. Rebuffé 1462
Kinematics of a Solid Body in Space of Three Dimensions. R. Woinarosky 1833
Extension of Jacobi's Theorem on Virial and Reference to Minimum Kinetic Energy. G. Lampariello 2279
General Equations of Restricted Relativistic Dynamics. G. Garcia 2280
Mechanics of Muscular Contraction in Man. W. O. Fenn 2281
Development of the Minor Axis in a Foucault Pendulum. B. Dasannacharya 2282
Controlled 0·2-Second Pendulum. G. Turetschek 2313
Unequal Moments of Inertia of Slabs. V. A. Nicolsky 2707
Trembling Movements. H. Diesselhorst 2708
Mechanics of Elastic Bodies. C. Cattaneo 3523
Flight of Projectile. R. H. Kent 3524
Dissipation of Energy by a Pendulum Swinging in Air. E. C. Atkinson 3525
Amplitude Deviation of Rate of a Pendulum. E. C. Atkinson 3526
Vertical and Horizontal Interchange in the Light of the Problem of Motion of Projectiles. H. Arakawa 4036
Mechanics of Elastic Collisions. Parts II and III. C. Cattaneo 4339
Graphical Arrangement of Accelerations of Points of Plane Figure in its own Plane. M. Manarini 4340
Variable Length Pendulum. M. Zeuli 4341
Stresses in a Heavy Disc Suspended from an Eccentric Peg. R. D. Mindlin 4777
General Problem of Exterior Ballistics. G. Garcia......................... 4793
Impact of Falling Mass on an Elastic Rectilinear Prism. L. Bergeron 4794
Mechanical Calculation of Surface Moments. F. Lorenz 4796

3. Statistical Mechanics (Classical).

Modernised Version of Gibbs' Use of the Grand Canonical Ensemble. R. H. Fowler 3527
Theory of Cooperative Phenomena. G. S. Rushbrooke.................... 3544
Distribution of Mass, Velocity, Momentum and Energy of Broken Pieces of Exploded Bodies. Part III. S. Suzuki and H. Nagasima 4342

Mechanics, Classical, *continued.*

Abstract Nos.

General Equation of Statistical Mechanics. B. Hostinský 4795
Relative Adsorbabilities of H_2 and D_2. A. Wheeler 4819

5. Unclassified.

Geometrics in Euclidean Space. R. de Saussura 4343

Stress Recording Devices. H. Freise 1871B

Mechanics, Quantum.

1. Matrix (or Symbolic) and Wave Mechanics.
2. Statistical Mechanics (Quantum).
3. Experimental Determination of "*h*."
4. Unclassified.

Cross-Reference:
Special Applications, *see* appropriate Key Headings.

1. Matrix (or Symbolic) and Wave Mechanics.

Structure of H_3, H_3^+ and of H_3^-. D. Stevenson and J. Hirschfelder 12
Dirac's Matrices. R. L. Gomes 62
Dirac's Function $\delta(x)$. M. Schönberg 63
Wave Functions for Large Arguments by the Amplitude Phase Method. J. A. Wheeler 64
Quantum Theory of Polarisability of Atoms and Ions in the Inhomogeneous Electric Field. H. Hellmann and S. J. Pschejetzkij 65
Transmutation Function for Deuterons. P. L. Kapur 144
Stability of Polyatomic Molecules in Degenerate Electronic States. Part II. Spin Degeneracy. H. A. Jahn 221
Symmetry between Particles and Anti-Particles. G. Racah 331
Ratio of Masses of Fundamental Particles. H. T. Flint 332
Theory of Elastic Scattering of a Beam of Particles by Atoms. K. C. Kar, M. Ghosh and K. K. Mukherjee 340
Elastic Scattering by Hydrogen and Helium. K. C. Kar 341
Molecular Viewpoint in Nuclear Structure. J. A. Wheeler 392
Mathematical Description of Light Nuclei by the Method of Resonating Group Structure. J. A. Wheeler 393
Quantum Mechanics of Systems of Electrified Particles. J. Solomon 467
Passage of Vector Magnitudes to the Corresponding Spinors by the Conception of "Sub-Spaces." Interpretation of Dirac's Equations. J. Roubaud-Valette 468
Quantum Theory of LiH$^+$. G. S. Gordadse 469
Penetration into Potential Barriers in Several Dimensions. P. L. Kapur and R. Peierls 470
Self-Consistent Field with Exchange for Calcium. D. R. Hartree and W. Hartree 471
Fluctuations in the Range of Corpuscular Rays. S. Titeica 606
Problem of the Existence of a Smallest Wave-Length. A. March 628
Stern-Gerlach Experiment with Electrons. F. Adler 854
New Mechanics of Material Systems. M. Mathisson 969
Spinning Electron and its Dynamics. M. Mathisson 970
Use of Charge-Conjugated Wave Functions in the Hole Theory of the Electron. H. A. Kramers 971
Tensorial Equations of the Magnetic Electron. J. Yvon 972
Centre of Gravity and Indeterminacy Relationships. J. L. Destouches...... 973
Eddington's Interpretation of Dirac's Equation. G. Lemaître 974
Beginnings of the New Quantum Theory. H. T. Flint 975
Rotational Energy-Levels of a Diatomic Molecule in a Tetrahedral Field. H. M. Cundy 976
Oppenheimer-Phillips Process (Nuclear Reactions). H. A. Bethe 1112
Interaction of Elementary Particles. Part II. H. Yukawa and S. Sakata .. 1306
Wave-Mechanical Problems as Boundary-Value Problems in Integral Equation Theory. J. W. Smith 1463
Expression of Physical Magnitudes as Functions of New Magnitudes Related to a "Sub-Space." J. Roubaud-Valette 1464
New Physical Space. H. Ostertag.. 1465
Van der Waals Forces between Symmetrical Rotators. K. G. Carroll 1466
Van der Waals Forces in Helium. C. H. Page 1467

For the **Key** to this Index see pp. 1182 to 1194.

Mechanics, Quantum, *continued.*

Abstract Nos.

Wave Functions and Permeabilities for a New Type of Potential Barrier. R. P. Bell 1468
Comparison of Wave-Functions for HeH^{++} and HeH^{+}. C. A. Coulson and W. E. Duncanson 1469
Electrodynamics of Ponderable Bodies. J. C. Slater 1470
Physical Reality and Dogmatic Atomic Theory. J. Stark, B. S. M. Rao 1472
Significance of Atomic Entities in Modern Atomic Structure. W. F. G. Swann 1473
Relativity and Quantum Theory. M. Born 1477
Approximately Relativistic Equations. G. Breit 1569
The Electron and Limits to the Precision of Electromagnetic Field Specifications. W. H. Watson 1740
Quantum Theory of Einstein-Bose Particles and Nuclear Interaction. N. Kemmer 1760
Whittaker's Solution of the Equation of Wave Motion. S. Syôno 1830
Uncertainty Relations in the Measurement of Space-Time. R. W. Ditchburn and H. Motz 1834
Dirac Matrix Systems of High Order. R. L. Gomez 1835
Construction of Zero-Order Wave Functions for Complex Atoms. B. Swirles 1836
Many-Body Problem in Wave Geometry. Part I. T. Hosokawa 1837
Born's Electrodynamics in Terms of Wave Geometry. T. Iwatsuki, Y. Mimura and K. Morgana 1838
Wave Geometry Unifying Einstein's Law of Gravitation and Born's Theory of Electrodynamics. T. Sibata 1839
Quaternion Theory. B. Kwal 1840
Application of the Method of the Self-Consistent Field to Atomic Nuclei. M. Matricon 1841
Self-Consistent Field for Iron. M. F. Manning and L. Goldberg 1842
Quantum-Mechanical Significance of Silberstein's Theory. T. Neugebauer 1843
Eddington's Treatment of Dirac's Equation. B. Popolsky 1844
Operational Reasoning, Reality and Quantum Mechanics. E. C. Kemble 1846
Quantum Mechanical Resonance and Internal Rotation. S. Mizushima and M. Kubo 2049
Fundamental Unit of Electric Charge. H. T. Flint and W. Wilson 2152
Geometrical Structure of Space and Electronic Atmospheres. G. Fournier 2204
Nuclear Forces and the Magnetic Moments of the Neutron and the Proton. H. Fröhlich, W. Heitler and N. Kemmer 2206
Theory of Elementary Particles. G. Wataghin 2283
Relativistic Wave Equations. H. Yamamoto 2284
Solutions of the Dirac and Photon Equation. G. Petiau 2285
Self-Consistent Field for Molecular Hydrogen. C. A. Coulson 2286
Quadrupole-Quadrupole Interatomic Forces. J. K. Knipp 2287
Principles of Physics. W. Scherrer 2289
Wave-Mechanics and Stellar Theory. H. Jehle 2320
Application of "Reciprocity" to Nuclei. M. Born 2649
Theory of "Spiral" Orbits of the Electron in a Coulomb Field. J. Frenkel and J. Rojansky 2709
Interaction Energy in Electrodynamics and in the Field-Theory of Nuclear Forces. E. C. G. Stueckelberg 2710
Principles of the Quantum Theory. F. Jüttner 2711
Quantum Theory and the Atomic Nucleus. N. Bohr 2712
Universal Length in the Theory of Elementary Particles. W. Heisenberg 2713
Ambiguity of the Wave Function. E. Schrödinger 2714
Artificial Limiting Conditions in the Kepler Problem. A. Sommerfeld and H. Welker 2715
Dirac Magnet Pole. P. Jordan 2716
Mean Distribution of Electrons in a Complex Atom. A. Datzeff 2717
Self-Consistent Field with Exchange for Potassium and Argon. D. R. Hartree and W. Hartree 2718
New Equations of Motion of Material Systems in a Minkowski World. J. Lubański 2723
Disintegration of Deuterons by Deuterons. J. Kreisler 2823
Excited States of the H^3 and He^4 Nuclei. S. S. Share 2887
Experimental Verification of the Quantum-Mechanical Dispersion Theory by Reflection and Diffuse Scattering of X-Rays from Zinc. W. A. Bruce 2916
Interaction of Elementary Particles. Part III. H. Yukawa, S. Sakata and M. Taketani 3000

For the **Key** to this Index see pp. 1182 to 1194.

Mechanics, Quantum, *continued.*

Abstract Nos.

Energy Loss of Elementary Particles with Integer Spin. E. C. G. Stueckelberg 3045
Improved Calculation of the Energies of Metallic Li and Na. J. Bardeen 3068
Compressibilities of Alkali Metals. J. Bardeen 3069
Monochromatic Plane Wave Solutions of Dirac's Equation. G. Petiau 3091
Energy-Momentum Tensor and Charge-Current Vector in Dirac's Equations for Particles with Spin Greater than $\frac{1}{2}h$. J. M. Jauch 3092
Proper-Values of Fundamental Operators in Dirac Election Theory. G. Petiau 3093
Application of Method of Self-Consistent Field to Atomic Nuclei. M. Matricon 3094
Relativistic Commutation Rules in the Quantum Theory of Fields. M. Schönberg 3095
Reciprocal Action. D. Iwanenko 3096
Interaction Forces in Electrodynamics and the Field Theory of Nuclear Forces E. C. G. Stueckelberg 3435
Binding Energies of Hydrogen Isotopes. A. H. Wilson 3437
Eulerian Parameters and Lorentz Transformations. H. S. S. Rao.......... 3528
Dirac's Equations in Riemannian Metric Space. W. Benedictus 3529
Interpretation of Quantum Theory. A. Landé 3530
Determination of Eigenvalues. P. Urban 3531
Theory of the Neutral Particle. W. H. Furry 3532
Energy Associated with the Two-Centre Problem. Part I. General Features of the Energy Surface. E. Monroe 3533
Completely Relativistic Wave Mechanics. L. Chadenson 3534
Wave Theory in Celestial Mechanics. P. Chadenson 3583
Calculation of Polarisability of a Molecule. M. M. Biedermann 3816
Deviation of the Nuclei of $^4_2$He and $^{16}_8$O from the Hartree Model. B. O. Grönblom 3883
Anomalous Case in Cauchy's Problem for the Wave Equation. E. Frola 3946
Operational Solution of the Wave Equation. L. A. Pipes 3947
Wave-Motion for Infinite Domains. A. N. Lowan 3948
Static Interaction of Charged Particles. C. D. Thomas 3958
Spin Phenomena and Boundary Conditions. F. Möglich 3959
Lower Limit for Theoretical Energy of Normal State of Helium. A. F. Stevenson and M. F. Crawford 4123
Indetermination of the Intervals and Origin of Explosion Waves. G. Wataghin 4170
Elementary Demonstration of the Wentzel-Brillouin Method. E. Persico .. 4344
Limits of Applicability of the Present Quantum Theory. W. Heisenberg 4345
Eddington's World-Theory. E. Schroedinger 4348
Generalisation of Relativity Transformations. G. Wataghin 4349
Theory of Absorption in Ionised Gas. Part I. Opacity in Stellar Material. Part II. Optical Properties of Liquid Metals. B. Majumdar 4463
Test of Wave Mechanics in Molecular Spectra and Recent Developments in the Spectrum of H_2. O. W. Richardson 4545
Quantum Theory of Biological Processes. P. Jordan 4721
Binding Energy of Li^6. H. Margenau and K. G. Carroll 4736
Theory of Hydrogen Molecule. T. Inui 4737
Field Theory of the Atom. H. Takeno 4797
Proper Transverse Energy of the Electron. G. Beck 4798
Theory of Electron Spin. W. Wessel 4799
Concept of a Discrete Space-Structure. A. March 4800
Wave Functions for Na$^-$ and K$^-$. D. R. Hartree and W. Hartree 4801
Calculation of Coulomb Wave Functions for High Energies. L. E. Hoisington and G. Breit 4802
Wave Functions and Potential Curves for Excited H_2. A. S. Coolidge and H. M. James 4939

2. Statistical Mechanics (Quantum).

Dissociation of the Degenerate Gas. A. B. Severny and N. N. Tunitzky 66
Quantum Theory of the Non-Ideal Gas. Part II. Behaviour at Low Temperatures. E. Beth and G. E. Uhlenbeck 258
Eigen-Time in Classical and Quantum Mechanics. V. Fock 472
Relativistic Framework for the Causality Principle. W. Scherrer 476
Applications of Super-Quantisation in the Wave-Mechanics of the Electron. E. Durandin and A. Erschow 977
Central Limit Theorem of Statistical Mechanics. K. Husimi 978

For the **Key** to this Index see pp. 1182 to 1194.

Mechanics, Quantum, *continued.*

Abstract Nos.

Statistical Mechanics of Condensing Systems. Parts III and IV. J. E. Mayer and S. F. Harrison ... 979
Computation of Fermi-Dirac Functions. J. McDougall and E. C. Stoner ... 980
Statistical Mechanics of the Adsorption of Gases at Solid Surfaces. F. J. Wilkins ... 988
Adsorption of A, N_2 and O_2 on Smooth Pt Foil at Low Temperatures and Pressures. F. J. Wilkins ... 989
Use of the "Grand Ensemble" in Statistical Mechanics. H. A. Kramers ... 1471
Determination of Intermolecular Forces from the Joule-Thomson Coefficients. J. O. Hirschfelder, R. B. Ewell and J. R. Roebuck ... 2085
Statistical Mechanical Treatment for the Absolute Rate of Chemical Reaction. J. Horiuti ... 2089
Collective Electron Ferromagnetism. E. C. Stoner ... 2167
Relativistic Study of the Joule-Thomson Effect in a Gas. Part I. D. V. Gogate ... 2511
Theory of Condensation. B. Kahn and G. E. Uhlenbeck ... 2512
Nuclear Collisions. L. Goldstein ... 2596
Statistical Mechanics of Condensing Systems. M. Born and K. Fuchs ... 2719
Collective Electron Energy and Specific Heat. E. C. Stoner ... 2948
Central Limit Theorem of Statistical Mechanics K. Husimi ... 3097
Relativistic Study of the Joule-Thomson Effect and Adiabatic Processes in a Gas. Part II. D. V. Gogate ... 3779
Dirac Electron Theory. E. L. Hill and R. Landshoff ... 3957
Final Multiplier and its Validity in Quantum Mechanics. R. Dugas ... 3960
Influence of Radiation on Ionisation Equilibrium. B. N. Srivastava ... 3961
Effusion Phenomena in Relativistic Quantum Statistics. B. N. Srivastava ... 3962
Exchange Forces and Electrostatic Forces between Ions in Solution. R. W. Gurney ... 4216
Phase Integrals and Thermodynamics. K. Husimi ... 4993
Low-Temperature Properties of Gaseous Helium. H. S. W. Massey and R. A. Buckingham ... 4997

3. Experimental Determination of "*h*."

Most Probable Value of the Electronic Charge and other Related Constants for 1938. R. A. Millikan ... 2997, 3832

Medical Radiology and Electrology.

1. Electrobiology.
2. Electrotherapy.
3. Radiography.
4. Radiotherapy:
    (*a*) Infra-Red Rays.
    (*b*) Ultra-Violet Rays.
    (*c*) X-Rays.
    (*d*) Radioactive Radiations.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References:
Industrial Radiography, *see* X-Rays.
See also Section B.—Electrical Engineering.

1. Electrobiology.

Changes in Human Brain Potential during the Onset of Sleep. H. Davis, P. A. Davis, A. L. Loomis, E. N. Harvey and G. Hobart ... 352
Electrical Responses of the Ear. E. G. Wever and C. W. Bray ... 809
Electrical Studies of Living Tissue. Part II. Correlation between Tissue Response and Voltage Distribution. A. G. Conrad, H. W. Haggard and B. R. Teare ... 1745
Experimental Analysis of Rein's Thermostromuhr for Small Flows. J. F. Herrick, E. J. Baldes and F. P. Sedgwick ... 1746
Oscillographic Study of the Cerebello-Cerebral Relationships. A. E. Walker 2180
Human Brain Potentials during the Onset of Sleep. H. Davis, P. A. Davis, A. L. Loomis, E. N. Harvey and G. Hobart ... 2181
Electrical Signs of Biological Activity. H. S. Gasser ... 2182
Mechanical Lag-Screen Oscillograph. F. E. Hoecker and A. G. Asher ... 2626
Electrical Excitation of the Human Heart with a Natural Impulse of Rhythm. H. E. Hollmann ... 3028
Electric Conduction of Self-Polarising Bodies. N. N. Malov ... 3861
Electronic Cardiotachometer. J. W. Horton ... 4250
Polyelectrophysiograph. O. L. Huddleston and R. W. Whitehead ... 4702

Medical Radiology and Electrology, *continued.*

Abstract Nos.

Bioelectric Phenomena of the Nervous System and Their Possible Application to Medicine. A. Baudouin and H. Fischgold 5065
Secondary Electromotive Phenomena of Nerve Tissue. A. Strohl and A. Djourno 5066
Differential Amplifier for Electrophysiology and for Bridge Measurements. H. König 5067

2. Electrotherapy.

Report on the First International Congress on Short Waves in Physics, Biology and Medicine, Vienna, 1937. O. Stierstadt 364
Electrical Oscillations and Biological Materials. W. H. Ward 1340

3. Radiography.

Nomogram and Exposure Calculator for Radiography. A. B. MacLean 360
Metallic Intensifying Screens. H. E. Seemann 888
Depth Effects in Roentgenograms. A. B. Meservey 2183
Soft Tissue Radiography. J. R. Carty 2184
Sharpness of Shadows in Radiography of the Lungs. R. R. Newell 2185
Localisation of Objects by X-Rays. H. Steinhaus 2922
Sharpness Index of X-Ray Intensifying Screens. H. Nitka 3407
Radio-Kinematography. van de Maele 3408
Construction of an Inexpensive X-Ray Kymograph. C. McNeill. 3409
Radiographic Models. W. E. Boyd 3862
Nomogram for Radiographic Mensuration. H. J. Holmquest 4251
Kineradiography by the Indirect Method. R. Reynolds 4252
Radiography of Sections. P. Roland 4703
Advantages of Non-Screen Radiography. H. H. Duerr 4704
Tomography. G. B. Bush 4705
Radiographic Detail. F. Bettelheim 5068

4. Radiotherapy.

(*b*) *Ultra-Violet Rays.*
U.V. Measurements of Natural and Artificial Sources of Radiation with the U.V. Dosimeter. W. Frankenburger and H. Hammerschmid 2627
Tests of Quartz Test Tubes of the Bioclimatic U.V. Dosimeter. L. W. Pollak and F. Fuchs 2628
Sublethal Effects of Long Wave-Length Ultra-Violet. A. C. Giese 2629
Emission of Short U.V. Radiation during Structure Formation. Part I. Radiation during Typical Coagulations. A. Rabinerson and M. Filippov 3215
Intensity of U.V. Radiation from the Sky in Iraq. W. P. Kennedy 3608
(*c*) *X-Rays.*
Radiation Dosimetry. L. H. Gray 361
Spectral Distribution of Scattered X- and γ-Rays. R. Payne-Scott 889
Prevention and Treatment of X-Ray Injuries of the Skin. H. Schmitz 890
Effect of Increase in Voltage (1500–300 kV Peak), Filtration and Skin-Target Distance on the Percentage Depth Intensity. C. L. Randall 891
Radiological Applications of the Geiger-Müller Counter. C. B. Braestrup, E. J. Murphy and M. D. Whitaker 892
Measurement of X-Ray Dosage by the Effect on Chromosomes. A. Marshak and J. C. Hudson 893
Condenser Discharge X-Ray Tube. K. H. Kingdon and H. E. Tanis, Jr. 894
Skin Reactions Caused by 1000 kV and 200 kV Radiations. R. S. Stone 1341
Simultaneous Cross-Radiation. M. A. Loebell 1747
X-Ray and Electrical Protection with Reference to X-Ray Tubes. M. J. Gross 1748
Intensities for Short Distance Therapy. M. C. Reinhard and H. I. Goodale 1749
Wave-Length as a Factor in Radiotherapy. J. H. D. Webster 1750
Biological Action of X-Rays. J. A. Crowther 1751
Wave-Length as a Factor in Radiotherapy. G. F. Stebbing 2186
Spatial Distribution of Radiation from a Supervoltage X-Ray Tube. Part II. K. E. Corrigan, B. Cassen and H. S. Hayden 2630
Back Scatter and Dosage. R S. Landauer 3029
Back Scatter. E. H. Quimby, L. D. Marinelli and J. H. Farrow 3030

Medical Radiology and Electrology, *continued.*

Abstract Nos.
Million Volt X-Ray Protection. R. Dresser and B. J. Cosman ... 3410
Calculation of Percentage Depth Doses. C. Packard ... 3411
X-Ray Distribution from Two Oblique Fields. M. C. Reinhard and F. Miers ... 3412
H.V. X-Ray Therapy in U.S.A. J. Belot and R. Coliez ... 3413
Physical Measurements in H.V. X-Ray Therapy. R. Phillips and G. S. Innes 3863
Stray-Radiation Survey of X-Ray Installations. C. B. Braestrup ... 4253
Concrete Protection against Hard X-Rays. F. Heidenreich and R. Jaeger ... 4254
Biological Experiements with a Condenser Discharge Type of X-Ray Tube. K. H. Kingdon, P. A. Zahl, C. P. Haskins and H. E. Tanis, Jr. ... 4706
How X-Rays May Kill Cells. H. Rudisill and J. H. Hoch ... 4707
Biophysical X-Ray Effect. K. Staunig and J. Löbering ... 4708
Grenz-Ray Therapy. Z. A. Leitner ... 4709
Dosage Chart for X-Ray Therapy. E. H. Quimby ... 4710
Effect of Filtration on Divergent Beams at Super-Voltages. H. S. Hayden, K. E. Corrigan and B. Cassen ... 4711
Attenuation and Transition Effects in the Absorption of Supervoltage Radiation. B. Cassen, K. E. Corrigan and H. S. Hayden ... 4712
X-Ray and γ-Ray Protective Values of Building Materials. G. W. C. Kaye, W. Binks and G. E. Bell ... 4713
Existence of a Critical Intensity. W. H. Love ... 4714
Development of H.V. X-Ray Tubes. C. C. Lauritsen ... 4715
Breakdown in X-Ray Tubes. N. C. Cordingly ... 4716
Characteristics of X-Rays. J. L. Weatherwax ... 4717
Mechanism of Delayed Killing of Maize Seeds by X-Rays. L. R. Maxwell ... 5069
Radiation Protection. R. Jaeger and H. Stubbe ... 5070
(*d*) *Radioactive Radiations.*
Absorption and Scattering of Hard γ-Rays. W. Gentner ... 150
Quantum-Counter Amplifiers for γ-Ray Detection, and Applications to Studies in Radium Poisoning. Robley D. Evans ... 362
Radiating Surfaces. Part II. J. van Roojen ... 363
Spectral Distribution of Scattered X- and γ-Rays. R. Payne-Scott ... 889
Relative Biological Effects Produced by Equal Radiation Doses from Radium and from Radon. W. H. Love ... 895
Four-Gramme Radium Unit. H. T. Flint and C. W. Wilson ... 1342
Rectangular Nozzle for Use in Radium Beam Therapy. W. H. Rann ... 1343
Wave-Length as a Factor in Radiotherapy. J. H. D. Webster ... 1750
Nuclear Physics and Medicine. L. G. Grimmett ... 1752
Small Flexible 2-Gramme Radium Unit. C. W. Wilson and N. H. Pierce ... 1753
Wave-Length as a Factor in Radiotherapy. G. F. Stebbing ... 2186
Dosage System for Interstitial Radium Therapy. R. Paterson and H. M. Parker ... 2187
Model for a Radium Beam Unit for Measuring Dosage and Planning Treatments. L. G. Grimmett ... 2631
Dosage Chart for Interstitial Radium Element Needles. L. A. Pomeroy ... 2632
Dosage System for Interstitial Radium Therapy. Part II. H. M. Parker ... 2633
Relative Action of Neutrons and X-Rays on Closely Related Tissues. R. E. Zirkle and I. Lampe ... 2634
Effect of Neutron Irradiation on the Production of Mutations in Drosophila Melanogaster. N. W. Timoféeff-Ressovsky and K. G. Zimmer ... 3414
Geometrical Factors in Measurement of Radiation in Röntgens. C. C. Lauritsen 3864
γ-Ray Measurement in Radiology. G. C. Laurence ... 3865
Measurements of Radiation Energy and True Tissue Dosage (Energy Absorption) in H.V. Therapy. L. Rovner ... 3866
Estimation of Dosage from Flat Radium Applicators. M. C. Reinhard and H. L. Goltz ... 3867
γ-Ray Measurement. W. Friedrich ... 4255
γ-Ray Measurement. G. W. C. Kaye and W. Binks ... 4256
γ-Ray and Neutron Generators and their Radiotherapeutic Possibilities. A. Bouwers ... 4718
Recovery of Lost Radium. R. B. Taft ... 4719
Radium Protection ... 4720
Cyclotron and its Applications. J. Chadwick ... 4900
Radiation Protection. R. Jaeger and H. Stubbe ... 5070
Depth Doses from Teleradium Units. W. V. Mayneord, and J. Honeyburne 5071
Dosage with Radium Surface Applicators of Small Area. J. E. Roberts ... 5072
Two-Gramme Radium Unit. F. L. Warburton ... 5073

For the **Key** to this Index see pp. 1182 to 1194.

Medical Radiology and Electrology, *continued.*

6. Unclassified.

Abstract Nos.
Units and Precautions in Radiology. E. P. Vanoni 1344
Mitogenetic Radiation. O. Glasser and H. Barth 1754
X-Ray and Radium Protection. 2188
Secondary Radiation Intensity as a Function of Certain Geometrical Variables. H. E. Seemann 2637
Physics and Biology of Radiation Effects on Genes. P. Jordan 3033
Quantum Processes in Radiobiology. K. Sommermeyer 3868
Action of Radiations on Biological Materials Capable of Recovery. Parts I and II. D. E. Lea 3869, 3870
Quantum Theory of Biological Processes. P. Jordan 4721
Biological Effect of Kathode Rays. C. P. Haskins 4722

Portable H.V. X-Ray Therapy Unit. I. I. Kaplan and S. Rubenfeld 147B
Innocuity of Alternating Voltages below 65V. L. Kervran 469B
Present Knowledge of the Causes of Death by Electrical Accidents. H. Freiberger 470B
Effect of Electromagnetic Centimetre Waves on the Central Nervous System. S. J. Turlyguin 471B
Triograph. H. E. Hollmann 850B
Diathermy and Short Wave Therapy. W. E. Schall 1262B
Action of Electricity upon the Body. A. K. Krüger 1619B
Electric Shock. G. Burnet 1620B
Life, Death and Short-Wave Radiation. S. G. Hibben 2947B
Method of Producing Intensive X-Ray Flashes. M. Steenbeck 3254B
Radiological and Electro-Medical Apparatus. R. S. Whipple 3255B

Melting and Boiling Points.

(*See* **Fusion and Solidification** *and* **Vaporisation and Condensation.**)

Meteorology.

1. Constitution of the Atmosphere at Various Levels. The Ozone Layer.
2. Temperature and Radiation.
3. Dynamical Meteorology (Pressure, Wind, Turbulence, Weather Maps and Forecasting).
4. Rain, Snow, Hail, Dew, Cloud, Fog, Moisture, Dust.
5. Climatology.
6. Optical Phenomena (Aurora, Night Sky, Visibility, Corona, Halo, etc.).
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References :

Cosmic Rays, *see* Emission (Radiation).
Electrical and Magnetic Phenomena, *see* Terrestrial Electricity and Magnetism.
Visibility, *see also* Vision.

1. Constitution of the Atmosphere at Various Levels. The Ozone Layer.

Absorption Coefficients and Mean Temperature of Atmospheric Ozone. G. Déjardin, A. Arnulf and D. Cavassilas 117
Deposition of Radioactive Elements from the Air by Aliverti's Method. G. Rosa 554
Observation of Atmospheric Ozone, North Japan, at Total Eclipse, 19th June, 1936. Y. Kawabata 555
Ultra-Violet Absorption Spectrum of Atmospheric Ozone. G. Déjardin and A. Arnulf 556
Atmospheric Absorption and the Absorption Coefficients of Ozone in the Visible Spectrum. G. Déjardin, A. Arnulf and R. Falgon 557
Properties of Ozone and their Geophysical Consequences. E. Vassy 558
Theory of Ionosphere. Part I. R. C. Majumdar 896
Observations in Highest Stratosphere Flight. 1545
Ionisation Balance and Amount of Radium Emanation in the Atmosphere. J. Clay and L. J. L. Dey 1565
Gases and their Pressures in the Upper Atmosphere. S. K. Mitra and H. Rakshit 2794
Molecular Dissociation in the Upper Atmosphere. R. C. Majumdar 2811
Vertical Distribution of Ozone in the Atmosphere. V. H. Regener 3606
Vertical Distribution of Atmospheric Ozone. F. W. P. Götz 4855

Meteorology, *continued.*

2. Temperature and Radiation.

Abstract Nos.

Greenhouse Effect of Volcanic Dust. W. J. Humphreys 118
Thermal Radiation and Absorption in the Upper Atmosphere. G. H. Godfrey and W. L. Price 119
Relations between Insolation and the Components of Total Radiation in the Climate of Paris. C. E. Brazier 559
Thermoelectric Actinometer with Built-in String Galvanometer. L. W. Pollak 560
Solar Radiation between 2000 and 3000 Å. K. O. Kiepenheuer 1078
Radiometric Measurements of U.V. Solar Intensities in the Stratosphere. R. Stair and W. W. Coblentz 1079
Properties of the Water Vapour Spectrum and their Relations to Atmospheric Radiation. W. M. Elsasser 1185
Variations in Temperature of the Free Atmosphere. H. Garrigue 1546
Photoelectric Ionisation in the Ionosphere. E. O. Hulburt 1564
Reutter's Heat Engine. H. Bock 2077
Artificial Production of Carbon Dioxide and its Influence on Temperature. G. S. Callendar 2356
Characteristics of Pyrheliometer with Spherical Absorber. L. F. Miller 2357
Solar Radiation and the Electric Charge of the Earth. G. Petrucci 2379
Solar Radiation and the Terrestrial Electric Field. G. Petrucci 2380
Photon Emission of a Black Body. A. E. Haas 2847
Far Infra-Red Absorption of Atmospheric Water Vapour. W. M. Elsasser 2889
Ionisation of F-Region before Sunrise. K. B. Mathur 3419
New Anomalous Effect in the Short-Wave End of the Solar Spectrum. S. Rodionov, E. Pavlova and N. Stoopnikov 3602
Variations of Solar Constant and their Relation to Weather. M. M. Paranjpe 3607
Intensity of U.V. Radiation from the Sky in Iraq. W. P. Kennedy 3608
Radiation Properties of the Snow-Cover. C. Thams 4032
Upper Air Temperature from Dissociation Theory. K. Senda 4427
Katabatic Winds and Prevention of Frost Damage. C. E. Cornford 4428
Electrical Field and Radiation of the Atmosphere. E. Medi 4441
Exploration of Atmosphere by Radio-Sonde. R. Bourgeois 4869
Infra-Red Absorption of Atmospheric Water Vapour. W. M. Elsasser 4935
Ionising Radiation Accompanying a Spark Discharge. H. Raether 5024

3. Dynamical Meteorology (Pressure, Wind, Turbulence, Weather Maps and Forecasting).

Theory of Monsoons. Part II. Vertical Distribution of Velocities. W. W. Shoulejkin 120
Weather Forecasting. P. Berger 561
Long Range Weather Forecasting. H. C. Willett 562
Oscillations of the Atmosphere. B. Haurwitz 563
Thermodynamics of Duststorms. B. N. Sreenivasaiah and N. K. Sur 564
Instability in Fluid Layers when the Lower Surface is Heated. S. L. Malurkar 565
Land and Sea Breezes. H. Arakawa and M. Utsugi 566
Determination of Height and Energy Relationships by Means of the "Emagram." H. Arakawa 1080
Extent of, and Temperature Arrangement within, a Vertical Temperature Circulation. A. Wagner 1081
Advective-Dynamical Theory of Pressure Changes and Their Periodicity. B. Haurwitz 1082
Physical Interpretation of Weather. E. W. Woolard 1083
Instability from Water Vapour. C. W. B. Normand 1084
Kinetic Energy Liberated in an Unstable Layer. C. W. B. Normand 1085
Importance of Vertical Motion in Development of Tropical Revolving Storms. C. S. Durst and R. C. Sutcliffe 1086
Mechanics of the Depression. C. J. Boyden 1087
Theory of Monsoons. W. W. Shoulejkin 1547
General Circulations and their Perturbations. A. Giào 1548
Photoelectric Anemometer for Studying Atmospheric Turbulence. R. Faillettaz 1549
Atmospheric Pressure Variations as Secondary Cause of Earthquakes. V. Conrad 1939

Meteorology, *continued.*

Abstract Nos.
Non-Homogeneity of Gradient Currents. T. Gustafson 2351
Diurnal Variation of Wind-Vector Due to Variation of Eddy Viscosity. T. Namekawa and T. Takahasi 2358
Cyclones in Bay of Bengal. S. N. Sen 2359
Cloud Forecasting: Daily Use of the Tephigram. R. M. Poulter 2360
Saturated-Adiabatic Ascent of Air through Dry-Adiabatically Descending Environment. J. Bjerknes 2361
Instability from Water Vapour. C. W. B. Normand 2362
Upper Wind Forecasting. B. C. Haynes 2795
Direct Calculation of Wind Velocity. G. Tiercy and C. Golaz 2796
Centres of Thunderstorms and "Centres" of Sources of Atmospherics. R. Bureau 2812
Thermodynamic Interpretation of Isentropic Charts. H. R. Byers 3170
Pressure Tendencies in Cyclones and Fronts. W. R. Stevens 3171
Period of 5·25 Years in Rainfall, Temperature and Pressure. H. J. de Boer .. 3172
Transatlantic Aviation and Meteorology. P. D. MacTaggart-Cowan 3173
Atlantic Flight and its Bearings on Meteorology. F. Entwistle 3609
Application of Wet-Bulb Potential Temperature to Air Mass Analysis. Part IV. E. W. Hewson 3610
Variation of Pressure Accompanying a Distortion of Air Flow. A. F. Crossley 3611
Development in Field of Barometric Pressure. R. C. Sutcliffe 3612
Wind Structure Beneath Warm Fronts. C. S. Durst 3613
Lunar Atmospheric Tide at Accra. S. Chapman 3614
Atmospheric Exploration by Radio-Sounding Balloons. H. A. Thomas 3615
Mechanism of Thundery Conditions at Karachi. S. Mal and B. N. Desai 3629
Atmospheric Soundings by Luminous Rays. Part II. J. Duclaux 4033
Upper Air Investigations and Radio Meteorographs. R. R. Bajpai 4034
Application of Line Integral Theorems of Hydrodynamics to Terrestrial and Cosmical Vortices. H. Philipps 4035
Vertical and Horizontal Interchange in the Light of the Problem of Motion of Projectiles. H. Arakawa 4036
Tropical Cyclones. E. Gherzi 4037
Effect of a Travelling Atmospheric Disturbance upon the Sea Surface. T. Takegami 4420
Equal-Area Transformation of Indicator Diagram and New Aerological Chart. W. Werenskiold 4429
Frontal Movements Contrary to Indicated Gradient Flow. A. K. Showalter 4856
Tornado of July 7, 1938, in Chiltern Hills. E. L. Hawke 4857
Anemoclinometer I.M.F.L. G. T. Walker 4871

4. Rain, Snow, Hail, Dew, Cloud, Fog, Moisture, Dust.

Recent Work on Aerosols (Dust, Smoke, Fog). W. L. H. Moll 22
Constant Velocity of a Falling Sphere. N. Frössling 53
Rate of Condensation of Dew. G. Yamamoto 567
Air-Earth Current, Visibility, Relative Humidity and Mass-Exchange. H. Grieger 580
Ice Formation in Clouds in Great Britain. W. H. Bigg 1088
Ice Accretion on Aircraft. G. C. Simpson 1089
Theory of Hailstone Formation. T. E. W. Schumann 1090
Evaporation of Falling Drops. N. Frössling 1091
Air Cells in Snowflakes and in other Forms of Ice. C. M. Heck 1550
Condensation on Board Ship. S. J. Duly 2094
Atmospheric Turbidity and Vapour Pressure near the Earth. D. Bidasio 2363
Fog Coronæ on the Puy de Dôme. J. Bricard 2364
Hygrometry. Part II. H. Ebert 2365
Snow Gauge, Instrument and Method. G. Crestani 2374
Chemical Properties of Aerosols. R. E. Liesegang 2664
Accurate Determination of Dew Point. A. W. Hixson and G. E. White 2797
Homogeneity of Longer Series of Rainfall Amounts in Europe. O. V. Johansson 2798
Artificial Production of Snow Crystals. M. Perutz 3174
Nomogram Method of Humidity Control. R. G. Bateson 3616
Evaporation Over Catchment Areas. D. Lloyd 3617

Meteorology, *continued.*

Abstract Nos.
Partition of a Region into Rainfall Districts. T. E. W. Schumann and W. L. Hofmeyr 3618
Water Vapour in Stratosphere and Upper Troposphere. D. Brunt and A. K. Kapur 3619
Diurnal Variation of Atmospheric Condensation-Nuclei. N. E. Bradbury and H. J. Meuron 4430
States of Dust. O. Brandt 4748
Artificial Snow. U. Nakaya 4858
Industrial Smoke Drift and Weather. H. H. Lamb 4859
Atmospheric Condensation Nuclei. H. Landsberg 4860
Psychrometric Charts. J. G. Albright 4868
Production of Condensation Nuclei in the Presence of Electrical Charges. G. Tohmfor and M. Volmer 5003

5. Climatology.

Variation of Frost Frequency in Air and Ground. E. Heyer 1551
Work of Drifting North Polar Station. P. Shirshov and E. Fedorov 2352
Oxford Expedition to North East Land, 1935-36. R. A. Hamilton 2366
British East Greenland Expedition, 1935-36, at Kangerdlugssuak. G. Manley 2367
Temperature of Surface Water of Western North Atlantic. G. Slocum 3164
Ice Ages. G. C. Simpson 3175
Apparent Persistence of One Type of Weather. W. G. Cochran 4861

6. Optical Phenomena (Aurora, Night Sky, Visibility, Corona, Halo, etc.).

Intensity Distribution Variation in the Auroral Spectrum. L. Vegard and E. Tønsberg 121
Height Measurement of Selected Auroral Forms. L. Harang 122
Survey of Facts and Theories of the Aurorae. E. W. Hewson 123
Photometry of the Purple Light. Part II. P. Gruner 124
Observations of a Searchlight Beam to an Altitude of 28 Km. E. O. Hulburt 125
New Results of Ionosphere Investigations and their Importance in Geophysics. R. Penndorf 373
Variation of the Ionisation of the Highest Layers of the Atmosphere during Northern Light and Terrestrial Magnetic Disturbances. L. Harang 374
Variation of Light from Night Sky and its Effect on Photography of Faint Nebulæ. C. T. Elvey and P. Rudnick 515
Diffuse Light from the Sky. I. A. Khvostikov 568
Geometrical Theory of Haloes. Part V. E. W. Woolard 569
Telephotometer for Atmospheric Transmission. L. J. Collier and W. G. A. Taylor 570
Air-Earth Current, Visibility, Relative Humidity and Mass-Exchanger. H. Grieger 580
Optical Illusions Produced by a Rotating Beacon. L. Dunoyer 685
Solar Activity and Haloes. H. Neuberger 1092
Position of the Auroral Zone. D. Barbier 1093
Yellow Radiation of the Night Sky. J. Cabannes and J. Dufay 1094
New Fluorescence Phenomenon in the Upper Atmosphere. R. Bernard 1552
Atmospheric Absorption and Molecular Diffusion. Tien Kiu 1553
New Band in the Absorption Spectrum of the Earth's Atmosphere. A. Adel and C. O. Lampland 1554
Aurora of Jan. 25, 1938. H. Garrigue and H. Camichel 1555
Auroral Spectrum of 25 January, 1938. J. Dufay and J. Gauzit 1933
Blueness of Sky and U. V. Radiation. H. Landsberg and H. Jobbins 1934
Seasonal Variations in Daylight. W. R. G. Atkins 1935
Polarisation of Sky Light Close to the Sun. W. M. Cohn 2368
Twilight Phenomena during Total Solar Eclipses. F. Link 2369
Intensity Variation of the D Lines in the Twilight Sky. R. Bernard 2370
Auroral Display of Jan. 25-26, 1938. E. W. Barlow, S. Chapman, G. Simpson and J. Evershed 2371
Auroral Region Temperature. L. Vegard and E. Tønsberg 2372
Presence of Sodium in the Upper Atmosphere. J. Cabannes, J. Dufay and J. Gauzit 2799

Meteorology, *continued.*

Abstract Nos.
Yellow Radiation 5893 Å of the Twilight Sky and Presence of Sodium in the Upper Atmosphere. R. Bernard 2800
Possible Presence of Certain Rays of the Neutral Na Atom in the Spectrum of the Night Sky. G. Déjardin 2801
Photographic Measurements of the Great Aurora of January 25-26, 1938. C. Störmer 2802
Height of Electric Currents near the Auroral Zone. A. G. McNish 2813
Theories of Magnetic Storms and Auroræ. S. Chapman 2814
Halo at Surface of Snow. A. Renaud 3176
Atmospheric Sodium. J. Cabannes, J. Dufay and J. Gauzit 3177
Brightness of Twilight Sky and Density and Temperature of Atmosphere. E. O. Hulburt 3178
Relation of Brightness of Night Sky to Zenith Distance. J. Rudnick 3620
Absorption of Light by the Atmosphere. A. Vassy and E. Vassy 3621
Scattering of Light by Particles in the Air. H. Grisollet 3622
Formation of Free Atoms of Sodium in the Upper Atmosphere. P. Bernard 3623
Bands of the OH Molecule in the Spectrum of the Night Sky. G. Déjardin and R. Bernard 3624
Height of Layer whence D Rays are Emitted and Origin of Na Atoms in this Layer. G. Déjardin and R. Bernard 3625
Atmospheric Optical Phenomena in North-East Land. R. Moss 3626
Preparation and Properties of Auroral Afterglows. J. Kaplan 3672
Analysis of Infra-Red Limit of Atmospheric Transmission. A. Adel and C. O. Lampland 4013
Rock-Salt Prismatic Solar Spectrum. A. Adel 4014
Origin of Infra-Red Telluric Absorption Band q_2. A. Adel 4015
Colour of the Night Sky. R. Grandmontagne 4038
Annual Variations in the Colour of the Night Sky. R. Grandmontagne 4039
Intensity of the Green Ray of the Night Sky. N. Wassmuth, V. Werzner, S. Tibilov and S. Freivert 4040
Atmospheric Absorption. Tien Kiu 4041
Atmospheric Light and Visibility. H. Koschmieder 4042
Sodium in the Upper Atmosphere. J. Cabannes, J. Dufay and J. Gauzit 4043
Interpretation of Aurora-Spectrum. J. Kaplan 4044
Production of Aurora Spectrum in the Laboratory. J. Kaplan 4045
Halo Phenomena and Solar Activity. G. Archenhold 4046
Motion of an Electrified Corpuscle in Presence of a Magnetic Dipole. C. Agostinelli 4224
Astrophysics at North Pole. B. G. Fessenkoff 4416
Presence of Sodium in the Atmosphere. R. Bernard 4431
Coefficients of Atmospheric Haziness. P. Lejay 4432
Path of Ray of Light Tangent to Surface of Earth. J. Sweer 4433
Processes and Conditions in the Auroral Region. L. Vegard 4434
Auroral Phenomena and the Structure of the Ionosphere. L. Vegard 4435
Coronæ and Anticoronæ in Fogs. J. Bricard 4862
Aurora of January 25-26, 1938. C. Störmer 4863
Auroral Spectrum. L. Vegard 4864
Polar Aurora and Night-Sky Light. H. H. Plaskett 4865
Brightness of Sky in Zenith. P. Gruner and T. Klee 4866
Recent Twilight Investigations. P. Gruner 4867
Artificial Daylight. R. Toussaint 4904

8. Unclassified.

Advances in International Meteorology in 1936 and 1937. W. R. Gregg 1937
Measurement of Sand Storms. R. A. Bagnold 3605
Annual Report of the Director of the Meteorological Office Presented by the Meteorological Committee to the Air Council for the Year Ended March 31st, 1938 4872
Aerological Observations by Means of Kites, Aeroplanes and Sounding Balloons in U.S.A. C. M. Lennahan 4873
Physics of the Upper Atmosphere. J. Zenneck 5075

Effect of Yaw on Vane Anemometers. R. H. Heald and P. S. Ballif 79B
Progress in Weather Forecasting. W. R. Gregg 3484B

For the **Key** to this Index see pp. 1182 to 1194.

Nebulæ.

Abstract Nos.
Nebular Counts and Hyperbolic Space. G. C. McVittie 98
Interpretation of Hagen's Clouds. H. Siedentopf 99
Low Terms in Cr III, Cr IV, Mn IV and Fe V. I. S. Bowen 204
Slit Spectrograph for Diffuse Galactic Nebulæ. O. Struve 508
Kinematical Theory and the Distribution of Nebulæ. G. C. McVittie 510
Photographic Studies of Nebulæ. J. C. Duncan 514
Variation of Light from Night Sky and its Effect on Photography of Faint Nebulæ. C. T. Elvey and P. Rudnick 515
Colour Indices of Reflection Nebulæ. O. C. Collins 516
Static Universe and Nebular Red Shift. Part II. S. Sambursky and M. Schiffer 1018
Red Nebulosity and Star Distribution in Orion. K. Graff 1021
Dark Nebula at ϱ Ophiuchi. Å. Wallenquist 1022
36000 Galaxies in the South Polar Cap. H. Shapley 1023
Red Indices of 104 External Galaxies. C. K. Seyfert 1024
Faint Northern Galaxies. C. K. Seyfert 1025
Stellar Distributiion in the Vicinity of a Southern Galactic Window. B. J. Bok and E. M. Lindsay 1026
Possibility of Expansion of a Slowly Rotating Spheroidal Mass of Incoherent Particles under Gravitational Forces. B. C. Mukerji 1027
Apparent Luminosity of a Receding Nebula. H. P. Robertson 1028
Comparison of Magnitude Sequences in the Two Magellanic Clouds. J. Mohr 1050
Photographs of Southern Clusters and Nebulæ. J. S. Paraskevopoulos...... 1051
Inclinations to the Line of Sight of the Non-Galactic Nebulæ. F. G. Brown 1509
Bright Nova of 1860 in Globular Cluster Messier 80, and its Relation to Supernovæ. H. B. Sawyer 1532
Features of a Planetary Nebula and a Nova. Y. Hagihara 1533
Expanding Universe. H. Shapley 1888
Extra-Galactic Nebulæ. J. H. Reynolds. 1890
Theory of Spiral Structure in the Nebulæ. B. Lindblad 1891
Apparent Luminosity of Receding Nebulæ. M. v. Laue 1892
Expansion of a Nebula. N. R. Sen 2323
Ages of Planetary Nebulæ. F. L. Whipple 2324
Distances of Extra-Galactic Nebulæ. G. C. McVittie 2325
Multiple Extra-Galactic Nebulæ. W. Fricke 2326
Ionisation and Recombination in the Theory of Stellar Absorption Lines and Nebular Luminosity. S. Chandrasekhar 2339
Nebular Spectrograph of the McDonald Observatory. O. Struve, G. van Biesbroeck and C. T. Elvey 2749
Survey of 16,639 Galaxies North of Declination + 70°. H. Shapley and R. B. Jones 3135
Inclinations of Spiral Nebulæ to the Line of Sight. H. Knox-Shaw 3136
Physical Processes in Gaseous Nebulæ. Part III. Balmer Decrement. J. G. Baker and D. H. Menzel 3137
Spatial Distribution of Spiral Nebulæ in Milne's Universe. W. Fricke 3581
Kinematical Theory, Curved Space and the Distribution of Nebulæ. G. C. McVittie 3582
Photographic Photometry of the Elliptical Nebulæ. (Second Paper). R. O. Redman and E. G. Shirley 3585
Application of the Velocity-Distance Relation for Spiral Nebulæ to Milne's Universe. W. Fricke 3988
Distribution of Galaxies in Northern Milky Way. H. Shapley and R. Jones .. 3991
Diffuse Nebula NGC 1982 of Orion Group Photographed in Red and Infra-Red Light. J. S. Paraskevopoulos 3992
Metagalactic Density-Gradient. H. Shapley. 3993
Magnitudes of Extra-Galactic Nebulæ. G. C. McVittie.................... 3994
Theory of Cyclical Transitions. L. G. Henyey 3995
Physical Processes in Gaseous Nebulæ. Part IV. D. H. Menzel, L. H. Aller and J. G. Baker 4385
Characteristics of Associated Galaxies. Part I. Density Restriction in the Metagalaxy. E. F. Carpenter.. 4386
Diffuse Nebulæ and Cosmic Absorption. V. A. Ambarzumian and S. G. Gordeladse 4387
Physical Processes in Gaseous Nebulæ. Part V. Electron Temperatures. J. G. Baker, D. H. Menzel, and L. H. Aller 4836

For the **Key** to this Index see pp. 1182 to 1194.

Oscillations and Waves, Electric.

1. Generation.
2. Amplification.
3, Rectification.
4. Measurement of Frequency.
5. Applications.
6. Wave Propagation :
   (*a*) General.
   (*b*) In Ionosphere.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References :
Crystal Rectification, *see* Conduction (Electric) in Solids and Liquids.
Frequency, *see also* Alternating-Current Networks.
Piezoelectric Oscillations, *see* Piezoelectricity.
See also Section B.—Electrical Engineering.

1. Generation.

Abstract Nos.
Behaviour of an Osglim Lamp. Part III. L. F. Richardson 291
Temperature of Electrons in a Magnetic Field. A. Slutzkin 345
Report on the First International Congress on Short Waves in Physics, Biology and Medicine, Vienna, 1937. O. Stierstadt 364
Electric Discharges in Neon. H. J. Lindenhovius.......................... 812
Voltage-Distribution and Electron Transit Time in Space-Charge-Limited Planar Diode. R. Cockburn 1345
Thyratron Impulse Generator. B. G. Pressey. 2638
Relaxation Oscillator with Double-Grid Valve. H. Morin 3415
Oscillator for Ultra-High Frequencies. W. L. Barrow 3416
Circuit Producing Sharp Electrical Impulses Free from Curvature and Their Use in Oscillographic Work. J. C. Morgan 3417
Triode Hysteresis. A. Iskander 4257
Stable-Frequency Valve Oscillators. Y. Rocard.......................... 4258
Short-Wave Oscillator. T. V. Ionescu 4259
Quartz Clock. L. Essen 3561
Luminous Appearances and Sinusoidal Electric Oscillations of the Flash Discharge. R. Ricamo 4623
Fluctuations of an Auto-Oscillating System. I. Berstein 4723

2. Amplification.

Valve Amplifier for Weak Currents. F. Bedeau and L. Herman............ 2132
Improved Circuit for the D.C. Amplifying Valve of a Valve Voltmeter. R. E. Burgess 2559
Background Noises and Valve Amplifiers. M. Mandò 3426
Currents of Conductors Induced by a Moving Point Charge. W. Shockey.... 4699

3. Rectification.

Differential Amplifier. J. F. Toennies 2133

4. Measurement of Frequency.

New Form of Frequency and Time Standard. L. Essen 2189
Determination of the Frequency of an Oscillator with a Condenser. H. Mukherjee 3871

5. Applications.

Electronic Circuits for Measurement of Time and Speed. H. J. Reich and H. Toomim 501
Electronic Recording Analytical Balance. R. H. Muller and R. L. Garman 3944
Push-Pull-Stabilised Triode Voltmeter. C. Williamson and J. Nagy........ 4631

6. Wave Propagation.

(*a*) *General.*

Dielectric Constant of a Space Containing Electrons. S. P. Prasad and M. V. Verma 313
Production and Absorption of Electromagnetic Waves from 3 cm. to 0.6 cm. in Length. N. H. Williams 366
Current and Potential Measurements with Ultra-Short Waves. J. Malsch .. 367
Electric Spectrum of Liquid Water for 5–20 cm. Wave-Lengths. H. W. Knerr 368
Reflection of Plane Wave Pulses from Plane Parallel Plates. M. Muskat...... 2013

Oscillations and Waves, Electric, *continued.*

Abstract Nos.

E.H.F. Electrical Constants of Soil. M. K. Chakravarty and S. R. Khastgir 2355
Simultaneous Transmission and Reception of Electric Waves. F. Minaw and H. Antoun 2639
Dielectric Constants of Ionised Gases. Part II. S. Gangopadhyaya and S. R. Khastgir 2984
Electrical Oscillations of a Prolate Spheroid. Part I. L. Page and N. I. Adams, Jr. 3034
Propagation of Radio Waves over a Finitely Conducting Spherical Earth. B. van der Pol and H. Bremmer 3035
Velocity of Propagation of Electric Waves along Thin Metal Wires and the Permeability of Iron for Hertzian Oscillations. K. F. Lindman 3418
Wave and Geometrical Optics. S. M. Rytov 3699
Attenuation of Ultra-Short Radio Waves Along the Earth. S. R. Khastgir and M. K. Chakravarty 4724
Velocity of Propagation of Electric Waves along Nickel Wires and Magnetic Permeability of Nickel for Hertzian Oscillations. K. F. Lindman 5074

(*b*) *In Ionosphere.*

Dissociation, Recombination and Attachment Processes in the Upper Atmosphere. Part I. H. S. W. Massey 130
Report of the First International Congress on Short Waves in Physics, Biology and Medicine, Vienna, 1937. O. Stierstadt 364
Diffractive Propagation of Radio Waves. Part III. B. Wwedensky 369
Ionosphere during Solar Eclipse, June 8th, 1937. I. Ranzi 370
Astrophysical Problems of the Ionosphere. N. E. Bradbury, A. G. McNish, J. H. Dellinger, R. S. Richardson 371
Chromospheric Eruptions and Ionospheric Disturbances. M. Waldmeier 372
New Results of Ionosphere Investigations and their Importance in Geophysics. R. Penndorf 373
Variation of the Ionisation of the Highest Layers of the Atmosphere during Northern Light and Terrestrial Magnetic Disturbances. L. Harang 374
Studies of the E-Region of the Ionosphere. J. E. Best, F. T. Farmer and J. A. Ratcliffe 375
Theory of Ionosphere. Part I. R. C. Majumdar 896
Summary of the Year's Work, Department of Terrestrial Magnetism, Carnegie Institution of Washington. J. A. Fleming 1110
Sudden Short-Wave Fading, and its Relation to Magnetic and Solar Phenomena. R. Jouaust, R. Bureau and L. Éblé 1346
Propagation of Electromagnetic Waves in an Ionised Atmosphere. L. G. H. Huxley 1347
Reflection Coefficients of Ionospheric Regions. E. V. Appleton and J. H. Piddington 1348
High-Latitude Radio Observations. A. B. Whatman and R. A. Hamilton 1755
Diurnal Variation of Ionospheric Absorption of Radio Waves. J. E. Best and J. A. Ratcliffe 1756
Polar Molecules and Radio Waves. M. C. Holmes 2190
Constitution of the Ionosphere and the Lorentz Polarisation Correction. H. G. Booker and L. V. Berkner 2191
Ionospheric Observations: Eclipse of June 8, 1937. H. W. Wells, H. E. Stanton and S. L. Seaton 2192
Ionisation, Negative-Ion Formation, and Recombination in the Ionosphere. N. E. Bradbury 2193
Reflection of Radio Waves from the Ionosphere. R. R. Bajpai 2640
Ionisation of F-Region Before Sunrise. K. B. Mathur 3419
Non-Seasonal Change of F_2-Region Ion-Density. L. V. Berkner and H. W. Wells 3420
Two Solar Eruptions. J. C. Dobbie, W. Moss and A. D. Thackeray 3600
F-Region of the Ionosphere. R. R. Bajpai and B. D. Pant 3872
Total Reflection of Electromagnetic Waves in the Ionosphere. S. N. Bose 3873
Reflection in the Ionosphere. I. Mihul and C. Mihul 3874
Effect of Longitudinal Magnetic Field on Conductivity and Refractive Index of Ionised Air. B. N. Singh 3875
Ionospheric Eclipse of 1940, Oct. 1. 4011
Critical Frequency of Radio Waves Reflected Obliquely from the Ionosphere. F. T. Farmer, C. B. Childs and A. Cowie 4260
Ionospheric Transmission at Oblique and Vertical Incidence. G. Millington 4261
Auroral Phenomena and the Structure of the Ionosphere. L. Vegard 4435

Oscillations and Waves, Electric, *continued.*

Abstract Nos.

Scattering of Radio Waves by the F-Region of the Ionosphere. H. G. Booker and H. W. Wells 4725
Production of Ionospheric E- and F-Regions and Lower-Altitude Ionisation Causing Radio Fade-Outs. O. R. Wulf and L. S. Deming 4726
Effects Caused in the Ionosphere by Electric Waves. Part II. V. A. Bailey 4727
Ionosphere and its Influence on the Propagation of Electric Waves. W. Dieminger 4728
Corpuscular Eclipse of 1940, Oct. 1. 4849
Physics of the Upper Atmosphere. J. Zenneck 5075
Study of Magneto-Ionic Theory of Wave Propagation by Means of Simple Formulæ, Linkages and Graphical Devices. V. A. Bailey and J. M. Somerville 5076

8. Unclassified.

Damping Coupling. G. Schmerwitz 5077

Frequency Standards. R. Mitenda, K. Tani and Y. Kusunose 78B
Ionisation of the F_2-Region. W. M. Goodall 239B
Ionosphere Measurements. K. Maeda and T. Tukada 240B
Theory of Plane Electromagnetic Waves. S. A. Schelkunoff 242B
Electromagnetic Wave Fields near Earth's Surface. C. R. Mingins 243B
Propagation of Ultra-Short Waves. H. Plendl and G. Eckart 589B
Reflection of Broadcasting Waves in the Atmosphere. C. Mihul and I. Mihul 591B
Measuring the Reflecting Regions in the Troposphere. A. W. Friend and R. C. Colwell 592B
Ionosphere Investigation with Limiting Waves. O. Burkard 593B
Characteristics of the Ionosphere at Washington. T. R. Gilliland, S. S. Kirby, N. Smith, and S. E. Reymer 594B
Clarification of Average Negative Resistance with Extensions of its Use. C. Brunetti 622B
Measurement of Phase Difference between Harmonic Oscillations of Different Frequencies. E. Schegolev 759B
Method of Measuring Velocity of Electromagnetic Waves. L. Mandelstam and N. Papalexi 775B
Characteristics of the Ionosphere at Washington, D.C., November, 1937. T. R. Gilliland, S. S. Kirby, N. Smith and S. E. Reymer 1018B
Technique of Short-Wave Measurement . R. Tamm 1042B
Resonance Effects in a Non-Linear System with Two Degrees of Freedom. V. Migulin 1052B
Method of Harmonic Analysis. G. F. Partridge 1181B
Sudden Ionospheric Disturbance. R. Bureau 1386B
Height of Ionosphere at Heiho, during 1936 Eclipse. T. Nakamura 1724B
Characteristics of Ionosphere. Y. Asami and M. Saito 1726B
Generation of Oscillations by an Electron Beam in the Field of a Plate Condenser. A. Recknagel 1750B
Annual Variations in Upper Atmospheric Ionisation. K. Maeda, T. Tukada and T. Kamoshida 2024B
Long Period Variations in the F_2-Region. K. Tani, Y. Ito and H. Sinkawa 2025B
Occurrences in the Ionosphere during Aurora Jan. 25th, 1938. F. Vilbig, B. Beckmann and W. Menzel 2026B
Abnormal Effects in Ionosphere during Aurora. W. Diemingen and H. Plendl 2027B
New Attachment Theory of Ionosphere. T. Tukada 2028B
Comparison of Field Intensities of Short Waves Received Simultaneously from European Stations at two Different Points in Japan. T. Amisima, U. Yamaguti, K. Endo and M. Nakagami 2029B
Maximum Usable Frequencies for Sky Wave Transmission 1933-7. T. R. Gilliland, S. S. Kirby, N. Smith and S. E. Reymer 2030B
Application of Vertical Incidence Ionosphere Measurements to Oblique Incidence Radio Transmission. N. Smith 2031B
Electromagnetic Field of Vertical Half-Wave Aerial. P. Rjasin 2033B
Hertzian Waves. Electronic Oscillations in Triodes. E. Pierret 2049B
Electric Oscillations. Resonance Phenomenon in Triodes. E. Pierret and C. Biguenet 2050B
Electron Streams. J. Müller 2062B

For the **Key** to this Index see pp. 1182 to 1194.

Oscillations and Waves, Electric, *continued.*

	Abstract Nos.
Recurrent Surge Oscillograph. G. J. Scoles	2131B
Reflection and Absorption of Decimetre Waves at Plane Dielectric Layers. W. Dällenbach and W. Kleinsteuber	2296B
Reflection by Layered Media. W. Pfister and O. H. Roth	2297B
Attenuation and Group Retardation in Ionosphere. G. Millington	2300B
Upper Atmospheric Ionisation and Solar Radiation. K. Maeda	2301B
Ionosphere during Northern Lights, 25-26 Jan., 1938. R. Eyfrig, G. Goubau, T. Netzer and J. Zenneck	2303B
Stability of 2m Waves. C. R. Burrows, A. Decino and L. E. Hunt	2304B
Metallic Ellipsoid as Frequency Stabiliser. K. Morita	2318B
Resotank Generator for Micro-Waves. A. Allerding, W. Dällenbach and K. Kleinsteuber	2326B
Propagation of Electromagnetic Waves over a Conducting Sphere. B. van der Pol and H. Bremmer	2523B
Abnormal Phenomenon in Short-Wave Transmission. D. Arakawa	2525B
Absorption of H.F. Energy in Geissler Tubes. V. P. Mihu	2640B
Abnormal Ionisation in the E-Region. J. A. Pierce	2788B
Radio Transmission Path and Magnetic Storm Effects. G. W. Kenrick, A. M. Braaten and J. General	2789B
Sudden Ionospheric Disturbances. J. Maire	2790B
Limit Waves and the Ionosphere. O. Burkard	2791B
Dispersion of Electromagnetic Waves above the Earth's Surface. J. L. Alpert, V. V. Migulin and P. A. Riasin	2792B
H.F. Technique. K. Krüger	2801B
Study of Ionosphere at Torrechiaruccia. A. Bottini	3054B
Changes in Ionosphere during Aurora. B. Beckmann, W. Menzel and F. Vilbig	3055B
Changes in Transmission Conditions for 10m. Waves 1935-7. E. Fendler	3056B
Experimental Research on Propagation of Ultra-Short Waves. W. Ochmann and H. Plendl	3058B
Surmounting the Earth's Curvature by Ultra-Short Waves. G. Eckart and H. Plendl	3059B
Diffraction Theory of Propagation of Ultra-Short Waves. G. Eckart	3060B
Diffraction and Refraction of Radio Waves round Earth. T. L. Eckersley and G. Millington	3061B
Electromagnetic Waves in Elliptic Hollow Metal Pipes. Lan Jen Chu	3062B
Electrical Resonator. W. W. Hansen	3334B
Wavemeter. Y. Miyamura	3409B
Unusual Range of Radio Signals. J. A. Pierce and H. R. Mimmo	3575B
Reflection Coefficients of Heaviside Layer. F. Vilbig	3576B
Radio Transmission and Solar Activity. E. V. Appleton	3578B
Forced Oscillations. F. Dacos	3589B
Relaxation Oscillations. J. J. Muller	3590B
Barkhausen Oscillations of Double Frequency. H. Mohr	3596B

Philosophy of Scientific Method.

Unity of Physical Theory. J. L. Destouches	67
Science and the Unobservable. H. Dingle	473
Physical Reality and Dogmatic Atomic Theory. J. Stark, B. S. M. Rao	1472
Significance of Atomic Entities in Modern Atomic Structure. W. F. G. Swann	1473
Philosophical Concepts in Modern Physics. E. U. Condon	1845
Operational Reasoning, Reality and Quantum Mechanics. E. C. Kemble	1846
"The Skeptical Physicist." P. R. Heyl	1847
Impulse and Conservative Causality in Nature. A. Mittasch	1848
Science, Logic and Philosophy. H. Jeffreys	2288
Pragmatic and Dogmatic Spirit in Physics. J. Stark	2720
Classification and Perception of Similarity. W. H. George	3098
Dimensions in Continuum Physics. R. Fürth	3522
Application of Statistical Methods to Manufacturing Problems. W. A. Shewhart	3535
Logic and Probability in Physics. C. G. Darwin	3963
Vision in Nature and Vision Aided by Science. (Lord) Rayleigh	4154

For the **Key** to this Index see pp. 1182 to 1194.

Photochemistry (including Photography).

1. General.
2. Photography:
   - (a) Theory.
   - (b) Development, Fixation, Reduction, Intensification, Toning.
   - (c) Sensitivity and Properties of Emulsions.
   - (d) Latent Image and Photographic Effects.
   - (e) Kinematography and Colour Photography.

2. Photography (*contd.*):
   - (f) Applications. Industrial Reproduction.
   - (g) Apparatus, *see* Supplementary Index.
   - (h) Unclassified.

Cross-References:
Photographic Photometry, *see* Photometry.
Stellar Photography, *see* Stars.
X-Ray Photography, *see* X-Rays.

1. General.

Abstract Nos.

Quantum Efficiency of Colour Centre Building in KCl and NaCl. G. Schaitberger 38
Photochemical Reactions in the Fluorite Region. Part II. Photochemical Decomposition of Formaldehyde Vapour. R. G. W. Norrish and W. A. Noyes, Jr. 169
Photochemical Polymerisation of Methyl Methacrylate Vapour. H. W. Melville 170
Photochemistry of Alkyl Nitrites. H. W. Thompson and F. S. Dainton 171
Grotthus and Einstein. W. D. Bancroft and R. C. Clapp 660
Absorption Spectrum and Photodecomposition of $KMnO_4$. A. L. S. Rao 712
Effect of Temperature on the Photochemical Bleaching of Visual Purple Solutions. H. J. A. Dartnall, C. F. Goodeve and R. J. Lythgoe 744
Photochemical Changes in Phosphorus Compounds and Fused Phosphates. J. Hoffmann 1154
Photochemical Decomposition of Methane at Schumann Wave-Lengths. W. Groth 1155
Photochemical Union of Hydrogen and Chlorine. Parts V–VII. H. C. Craggs, G. V. V. Squire and A. J. Allmand 1156
Electron Conduction and Photochemical Reactions in Alkali Halide Crystals. R. W. Pohl 1277
Photolysis of Acetone in Presence of Hydrogen. H. S. Taylor and C. Rosenblum 1612
Photo-Decomposition of Adsorbed Acetone. W. Kudrjawzewa and N. Prileshajewa 1997
Mercury Photosensitised Decomposition of Ethane. E. W. R. Steacie and N. W. F. Phillips 1998
Photosensitisation by Titanium Dioxide. C. F. Goodeve and J. A. Kitchener 1999
U.V. Emission Spectra of the Slow Thermal Decomposition of Sodium Azide. R. Audubert 2040
Photochemical Processes in Crystals. R. Hilsch and R. W. Pohl 2249
Photodecomposition of CH_3I and C_2H_5I. W. West and L. Schlessinger 2427
Optical and Photochemical Study of the Vapours of Cuprous Halides. J. Terrien 2471
Photochemical Formation of Phosgene. Part X. W. Franke and H. J. Schumacher. Part XI. M. Bodenstein, W. Brenschede and H. J. Schumacher 2868
Mechanism of Formation of HgH and HgD. Optical Excitation of CdD. L. O. Olsen 2870
Photosensitivity of Diphenylamine-*p*-Diazonium Sulphate by the Method of Photometric Curves. C. F. Goodeve and L. J. Wood 2879
Photolysis of H_2S. G. S. Forbes, J. E. Cline and B. C. Bradshaw 3676
Action of U.V. Rays on Mercury Fulminate. A. Borocco 3677
Photochemical Processes in Crystals. R. Hilsch and R. W. Pohl 3678
Primary Processes in Photodecomposition. M. Burton and G. K. Rollefson 3679
Fluorescence and Photodecomposition of Acetone Vapour. M. S. Matheson and W. A. Noyes, Jr. 4089
Photochemical Decomposition of N_2O. F. C. Henriques, Jr., A. B. F. Duncan and W. A. Noyes, Jr. 4096
Photochemical Primary Process of Ions in Aqueous Solution. A. Farkas and L. Farkas 4097
Separation of Hydrogen Isotopes in Photochemical Liberation from Aqueous Solutions. A. Farkas and L. Farkas 4098
Chemical Reactivity. H. W. Melville 4099

For the **Key** to this Index see pp. 1182 to 1194.

Photochemistry (including Photography), *continued.*

Abstract Nos.

Photochemistry. H. S. Taylor, F. Daniels, R. G. Dickinson, G. Kornfeld, P. A. Leighton, W. M. Manning, G. K. Rollefson and H. S. Taylor 4485
Photochemical Researches in the Extreme Ultra-Violet. Part VI. W. Groth and P. Harteck 4486
Photochemical Researches in the Extreme Ultra-Violet. Part VII. K. Faltings, W. Groth and P. Harteck 4487
Photodecomposition of Ethyl Methyl Ketone by Wave-Lengths from 1850–2000 Å. V. R. Ells and W. A. Noyes, Jr. 4488
Mercury Photosensitised Decomposition of Ethane. E. W. R. Steacie, W. A. Alexander, and N. W. F. Phillips 4917
Competition of Predissociation Processes in the Photolysis of Polyatomic Molecules. G. K. Rollefson and M. Burton 4918
Photolysis of ND_3. M. Burton 4919
Effects of Radiation on Oil. W. Stenstrom and I. Vigness 4973

2. Photography.

(*a*) *Theory.*
Contrast of Photographic Positive Papers. J. Bontenbal 1613
Action of Light on Photographic Emulsions. N. F. Mott 2428
Photography. C. E. K. Mees 4489
(*b*) *Development, Fixation, Reduction, Intensification, Toning.*
Photographic Image Formation and Developer Compositions. E. Schloemann and E. Trabert 172
Fine Grain Developers and a Method of Determining Graininess. W. Reinders and M. C. F. Beukers 2429
Dark-Room Illumination. A. van Kreveld and J. A. M. van Liempt 2430
Brightness-Distribution in Image-Plane of Photographic Objectives. K. Pritschow 2435
Potential of Pt Electrodes in Photographic Developers. A. E. Cameron 2585
Adsorption Theory of Photographic Development. A. J. Rabinovitch 3680
Rapid Development and Fixing of Photographic Negatives. A. Charriou and S. Valette 4100
(*c*) *Sensitivity and Properties of Emulsions.*
Desensitisation by Pressure. Lüppo-Cramer 173
Sensitisation of Plates by Sodium Salicylate. Tien Kiu 174
Mass and Distribution of Photolytic Silver in Silver Bromide Gelatin Emulsions. W. Meidinger 175
Spectral Sensitivity of Photographic Emissions. R. Mecke and F. Rose 661
Spectral Sensitivity of Photographic Emulsions. B. Richter 662
Silver Halide Layers without Protective Colloid. Lüppo-Cramer 663
Silver Bromide Layers Poor in Gelatin. Lüppo-Cramer 664
Photography of Dark Hot Bodies. T. Takéuchi and T. Sugita 668
Sensitivity of Photographic Plates in the Region 2500–2000 Å. A. Hunter and R. W. B. Pearse 1157
Scheiner and DIN Degrees. G. Hansen 1158
Retinal and Photographic Resolving Powers. V. Ronchi 1225
Colour of Outdoor Photographic Subjects. F. H. G. Pitt and E. W. H. Selwyn 1584
Colour Charts in Photography. E. R. Davies and E. W. H. Selwyn 1585
Sensitometric Investigations. W. Seifert 1614
Mercury Hypersensitisation of Photographic Plates. F. L. Whipple, D. Norman, R. Loevinger 2000
Influence of Surface Active Anions and Kations on Halogen Silver Sols and Photographic Emulsions. Part I. A. Lottermoser and R. Steudel 2001
Limits of Infra-Red Sensitisation. G. Kornfeld 2002
Influence of Surface Active Anions and Kations on Halogen Silver Sols and Photographic Emulsions. Part II. A. Lottermoser and R. Steudel 2431
Action of Various Elements and Compounds on Photographic Plates. Part II. S. Aoyama and T. Fukuroi 3219
Simple Form of Tube Sensitometer. D. L. Edwards 3220
Graininess of Negative Layers. G. Hansen and P. H. Keck 3221
Dark Room Filters for Use with Infra-Red Photographic Layers. M. Plotnikow 3228
Gelatin for Photographic Use. A. P. H. Trivelli and W. F. Smith 3681
Contrast and Number of Grains in Photographic Emulsions. A. P. H. Trivelli and W. F. Smith 3682

Photochemistry (including Photography), *continued.*

Abstract Nos.
Spectral Sensitivity of Photographic Layers. J. Eggert and M. Biltz 3683
Photosensitisation by Solids. C. F. Goodeve and J. A. Kitchener 3684
New Time Phenomenon in Photographic Emulsions. F. Weigert 3685
Photographic Sensitivity. Lüppo-Cramer 3686
Two-Prism Spectrograph for Studying U.V. Sources of Radiation and Photographic Emulsions. P. Gesteau 3742
Stability of Viscose Type of Ozaphane Photographic Film. A. M. Sookne and C. G. Weber 4490
Foreign Nuclei in AgBr. Lüppo-Cramer 4491
Photographic Sensitivity and the Reciprocity Law at Low Temperatures. W. F. Berg and K. Mendelssohn 4492
Progress in Infra-Red Technique. M. Czerny and H. Röder 4561
(*d*) *Latent Image and Photographic Effects.*
Effect of Temperature on Production of Latent Image by Hydrogen Peroxide. M. W. Jones and J. M. Blair 176
Theory of Photolysis of Silver Bromide and Photographic Latent Image. R. W. Gurney and N. F. Mott 665
Sabattier Effect. A. Marriage 1159
Nature of Silver Photo-Halides and their Relation to the Latent Photographic Image. H. Socher 1615
Anomalous Adsorption in Photographic Phenomena. Lüppo-Cramer 2432, 3222
Nucleus Constancy of the Latent Image. Lüppo-Cramer 3223
Influence of Partial Grain Solution on Developable Blackening. G. Ungar 3687
Latent-Image Formation, Reciprocity Law Failure at Low Temperatures. J. H. Webb and C. H. Evans 3688
Mechanism of Photographic Reversal. G. W. W. Stevens and R. G. W. Norrish 3689
Physical Development of the Latent Image. W. Reinders and M. C. F. Beukers 3690
(*e*) *Kinematography and Colour Photography.*
"Kodachrome" Colour Photography. L. Lobel and R. Auvillain 177
Theory of Additive Three-Colour Photography. G. B. Harrison and R. G. Horner 666
New Records from Electric Spark Photography. H. Schardin and W. Struth 667
Photographic Study of Lightning. R. E. Holzer, E. J. Workman and L. B. Snoddy 1563
Theory of Colour Photography. Part I. H. Frieser and R. Reuther 1616
Progress of Colour Photography. D. A. Spencer 2003
Year's Progress in Kinematography. R. H. Cricks and I. D. Wratten 2004
Motion Picture Polarigraph. W. M. Cohn 2878
Manufacture of Motion-Picture Film. A. E. Amor 3224
Analysis Filters in Colour Reproduction. H. D. Murray and D. A. Spencer 3225
Theory of Additive Three-Colour Photography. G. B. Harrison and R. G. Horner 3226
Radio-Kinematography. van de Maele 3408
Theory of Additive Three-Colour Photography. A. C. Hardy 4101
Simplified and Compact Tricolour Mixing Device. C. N. Warfield 4466
(*f*) *Applications. Industrial Reproduction.*
Rapid Calibration and Correction of Comparator Screws and Photographic Production of Scales. G. R. Harrison 962
Ilford Screen Direction Indicator. F. J. Tritton and E. T. Wilson.......... 1160
Photography in the Exploration of the Universe. H. Spencer Jones 2433
Exposure Times in Aerial Photography. C. A. Traenkle 3227
Reflex Copying. L. van der Grinten 4493
(*h*) *Unclassified.*
Dimensional Changes in Aerial Photographic Films and Papers. R. Davis and E. J. Stovall 180
New Method in Infra-Red Spectrography. M. Czerny and P. Mollet 687
Photoelectric Control of Exposure in Photographic Printing. C. Tuttle 1161
Coating-Thickness and Picture-Definition. 1162
New Experiments on Infra-Red Photography. M. Czerny and P. Mollet 1163
Stereoscopic Calculations. B. Wright, C. W. Wilman 1164
Intensities of the Principal Conversion Electron Rays of the Active Deposit of Thoron and the Photographic Efficiency of Electrons. R. Arnoult 1576
Surface Quality of Photographic Paper. A. Narath 1618
Flare in Schmidt Cameras. C. H. Smiley 2006

For the **Key** to this Index see pp. 1182 to 1194.

Photochemistry (including Photography), *continued.*

Abstract Nos.
Theory of Photodichroism. S. Nikitine 2875
Photographic Resolving Power in the Construction of Optical Instruments. G. Hansen 3229
Measurement of Specular Density. F. H. G. Pitt 3230
Photography and Kinematography of the Emission of the Scent of Flowers. H. Devaux 3691
Theory of Photodichroism. S. Nikitine 4498
Photodichroism of Cyanine. S. Nikitine 4925

Photoelectricity.

1. General Theory.
2. Photoelectric Emission (Special Substances).
3. Photoelectric Cells, Properties of.
4. Photoconductivity.
5. Becquerel Effect.
6. Applications.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-Reference :
Photoelectric Photometry, *see* Photometry.

1. General Theory.

Thermionic Emission. E. W. B. Gill 1359
Conduction in Polar Crystals. Part I. N. F. Mott and M. J. Littleton. Part II. N. F. Mott. Part III. R. W. Gurney and N. F. Mott 1708
Photoelectric and Thermionic Investigations of Thoriated Tungsten Surfaces. A. King 2198
Photo-E.M.F. in Semiconductors. B. Davydov 2641
Electron Movements at Exterior Boundary Surfaces. R. Suhrmann 4264
Energy States of Valency Electrons in Metals. M. Satô 4292

2. Photoelectric Emission (Special Substances).

Volta Effect in Vacuum. E. Perucca 349
Normal Energy Distribution of Photoelectrons from Sodium. C. F. J. Overhage 376
Surface Photoelectric Effect. W. V. Houston 377
Influence of External Field on the Electron Emission Constants of Ba-Coated Platinum Surfaces. R. Suhrmann and J. L. v. Eichborn 385
Energy Distribution of Photoelectrons from Sodium. A. G. Hill 1349
Blocking-Layer Photoelectric Effect of Cæsium Oxide. H. Teichmann 1350
Photoelectric Sensitisation of Aluminium. L. P. Thein 1757
Electrical Properties of Metal Films. E. Perucca 2564
Secondary Electron Emission from Complex Kathodes of Rb and K. P. Timofeev and A. Pjatnizki 3005
Secondary Emission of Thin Films of Alkali Metals upon Au, Ag and Pt Substrates. A. Afanasjeva and P. Timofeev 3006
Photoelectric Properties of Evaporated Bismuth Films. A. H. Weber 3421
Compound Photokathodes. P. Görlich 3424
Contact P. D. between Ba and Mg. P. A. Anderson 5058
Optical Properties and Photoelectric Emission in Thin Alkali Metal Films. H. E. Ives and H. B. Briggs 5078

3. Photoelectric Cells (Properties of).

Selective Photoelectric Effect Using Mixed Sheet Oxide Kathodes. R. Fleischer and H. Pietzsch. 378
Action of Kathode Rays on Selenium Cells. A. Becker and E. Kruppke 379
Effect of Mixed Light on Emission Photo-Cells. S. Petralia 1351
Photoelectric Cell Circuit with a Logarithmic Response. J. Russell 1352
Sensitisation of Transparent Compound Photo-Kathodes. P. Görlich 1353
Photo-Kathodes in Contact. P. Görlich. 1354
"Drift Effect" in Selenium Photovoltaic Cells. E. Elvegård, S. Lindroth and E. Larsson 1355
Resistance in Selenium Photovoltaic Cells. E. Elvegård, S. Lindroth and E. Larsson 2194
Influence of Vapours on the Spectral Sensitivity of Photon Counters. R. Audubert and J. Mattler 2437
New Phenomenon in Photo-Cells at High Frequencies. P. Grivet 3422
Properties of Emission Photo-Cell of New Design. G. A. Boutry and J. Gillod 3423

Photoelectricity, *continued.*

Abstract Nos.

Selenium Photo-Cells. H. Schweickert 3425
Cu_2O Rectifiers. H. Nöldge. 3807
Effect of H. F. Oscillations on Photoelectric Currents. T. Terada 3876
New "Positive" Barrier Plane Photoelectric Effect and the New Barrier Plane Photo-Cell. B. Kolomiez 4262
Time Lag in Gas-Filled Photoelectric Cells. A. M. Skellett 4729
Accuracy of Rectifier-Photoelectric Cells. J. R. Atkinson, N. R. Campbell, E. H. Palmer and G. T. Winch 5079

4. Photoconductivity.

Influence of Temperature on Primary Photoelectric Current in Alkali Halide Crystals. G. Glaser 380
Secondary Photoelectric Current. R. Hilsch and R. W. Pohl 381
Negative Photoconductivity in Polycrystalline Cuprous Oxide. P. G. Borziak 897
Stationary Photoelectric Primary and Secondary Currents in Crystals, particularly in KH-KBr Mixed Crystals. R. Hilsch and R. W. Pohl 1356
Theory of Photoconductivity. N. F. Mott 1357

5. Becquerel Effect.

Photoelectric Sensitivity of ZnO. E. Hoja 3877

6. Applications.

Chromaticity Limitations of the Best Physically Realisable Three-Filter Photoelectric Colorimeter. J. A. van den Akker 621
Photoelectric Pendulum Control for Recorder Clocks. A. C. Ruge and H. E. McComb 1495
Non-Ohmic Resistance for Use with Geiger-Müller Counters. G. P. S. Occhialini 1715
Two Relays Incorporating Photo-Cells. A. Grace 2195
Photovoltaic Cells and Their Applications. W. Behrendt 3036
Photoelectric Current Limiting Device for Insulation Measurements. E. B. Baker and H. A. Boltz 3362
Photoelectric Contact-Making Galvanometer. W. L. Carson 3878
Physics in Pharmacy. R. L. McFarlan 4563

8. Unclassified.

Influence of an Electric Current on Phosphorescence of Semiconducting Zinc Sulphide. G. Déchêne 651
Photoelectric Ionisation in the Ionosphere. E. O. Hulburt 1564
Photoelectrets. G. Nadjakoff 3037
Determination of the Cross- Section of Metastable He Atoms with the Aid of Their "Photoelectric" Effect. R. Dorrestein and J. A. Smit 4331
Scattering and Photoelectric Absorption of H.V. X-Rays in Nitrogen. H. C. Trueblood and D. H. Loughridge 4971

Light-Sensitive Cell Reflectometer. G. R. Baumgartner 541B
Problem Concerning Photoelectric Photometry. S. Barletta 542B
D.C. Amplifier for Photo-Cells. R. W. Gilbert 1354B
Reproduction of Images by Photoconductive Effect. H. Miller and J. W. Strange 1772B
Light Storing Television Tube. G. Krawinkel, W. Kronjäger and H. Salow 1774B
Photoelectric Emission. G. Todesco 2255B

Photometry.

1. Theory.
2. Visual Methods.
3. Physical Methods.
4. Standards, Units.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Colour Measurement, *see* Colorimetry.
Reflecting Power, *see* Reflection, Refraction and Dispersion.
Spectrophotometry, *see* Spectra.
Stellar Photometry, *see* Stars.
X-Ray Photometry, *see* X-Rays.

Photometry, *continued.*

1. Theory.

Abstract Nos.

Theory of the Luminous Field. A. Blondel 181
Photometric Invariant. A. A. Geršun 1619
Photometry of Projectors. W. M. Hampton 2436
Theory of the Luminous Field. A. Gersun 4920
Problems of Photometry and Colorimetry. J. Dourgnon 4921

2. Visual Methods.

Integrating Power of the Eye for Short Flashes of Light. T. E. Gilmer 182
Relative Luminosity of Radiation at Wave-Lengths 5780 and 5461 Å for the Average Photometric Observer. J. S. Preston 2007
Problems in Heterochromatic Photometry. H. König 3692
Photometry of Coloured Light Sources. W. E. Forsythe, B. T. Barnes and A. L. Shrider 3693
Spectral Luminosity Curve of the Eye. A. Dresler 3694
Equivalent Luminous Intensity of Rotating Beacons. G. K. Neeland, M. K. Laufer and W. R. Schaub 3746
Tungsten, Mercury and Sodium Illuminants at Low Brightness Levels. M. Luckiesh and A. H. Taylor 4102
Optical Resolution and Visual Examination of Two Overlapping Photographic Images. J. K. Robertson and R. H. Hay 4567
Photometry of Projection Apparatus at Short Distances. A. Marsat and P. Cibié 4922

3. Physical Methods.

Photometry of the Purple Light. Part II. P. Gruner 124
New Objective Method of Heterochromatic Photometry. J. Vorobeitchik 669
Intensity Curves of Light Pulses of Short Duration. J. D. Kelley 1165
Portable Photoelectric Illumination Meter. J. S. Preston 1620
Submarine Photometer for Studying the Distribution of Daylight in the Sea. C. L. Utterback and P. M. Higgs 1930
Seasonal Variations in Daylight. W. R. G. Atkins 1935
Recording Photoelectric Spectroradiometer. V. M. Albers and H. V. Knorr 2008
Isochromatic Energy Curves for a Black Body in the Region 2800–3060 Å. I. L. Roich 2418
Influence of Vapours on the Spectral Sensitivity of Photon Counters. R. Audubert and J. Mattler 2437
Photoelectric Integrating Photometer. A. Blondel 2872
Conversion of Polarisation Spectrophotometric Readings. L. Honty 2879
Photovoltaic Cells and Their Applications. W. Behrendt 3036
Apparatus for Testing Highway Sign Reflector Units. R. Kingslake 4495
Progress in Infra-Red Technique. M. Czerny and H. Röder 4561
Spectral Transmissions of Absorbing Screens for Photometry. G. Déjardin, D. Cavassilas and R. Minangoy 4564
Photographic Photometry of Interference Fringes. J. Roig 4915
Automatic Intensity Recorder for Photon Counters. M. Kato 4923

4. Standards, Units.

Radial Inhomogeneity in Emission from an Indirectly Heated Hg Discharge Tube. E. Fischer and H. König 2417

6. Unclassified.

Reduction of Scale Deflections in Radiometry. T. E. Sterne 2425
Selected Ordinates for Luminosity Computations. D. L. MacAdam 3233

Tests on Filament Projector Lamp. H. Pécheux 2252B

Piezoelectricity.

1. Statical Phenomena.
2. Piezoelectric Oscillations.
3. Pyroelectricity.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-Reference:
Piezoelectric Oscillations, *see also* Acoustics.

For the **Key** to this Index see pp. 1182 to 1194.

Piezoelectricity, *continued.*

1. Statical Phenomena.

Abstract Nos.
Variations of Lattice Dimensions Produced by Electrostatic Forces in Piezoelectric Crystals. V. Dolejšek and M. Jahoda 1758
Effect of Hydrostatic Pressure on the Susceptibility of Rochelle Salt. D. Bancroft 2142
Shot Effect with Space Charge. J. M. Whittaker 3038

2. Piezoelectric Oscillations.

Further Study of X-Ray Diffraction in Quartz. G. W. Fox and J. R. Frederick 747
Radial and Torsional Vibrations of Annular Quartz Plates. A. Žáček and V. Petržílka 797
Acoustical Detection of Electrically Weak Vibrations in Quartz Plates. W. H. H. Pielemeier 800
Damping of Piezoelectric Vibrations. W. Bosshard and G. Busch 1358
Piezoelectric Quartz Seismograph. E. Rothé 1942
Relaxation Time in Rochelle Salt Crystals. Part II. R. D. Shulvas-Sorokin 2197
Dielectric Constant of Rochelle Salt. D. Doborzynski 2573
Resonance in Crystal Beams of Sodium-Ammonium Seignette Salt. W. Mandell 2642
Application of Quartz Crystals to the Modulation of Light. D. W. R. McKinley 2841
Velocity of Propagation of Elastic Waves in Piezoelectric Crystals. E. Baumgardt 3879
Diffuse Scattering of X-Rays from Piezoelectrically Oscillating Quartz. G. E. M. Jauncey and W. A. Bruce 4263
Circuit Details for a Small Supersonic Oscillator of the Piezoelectric Type. W. C. Bosch and W. G. Allée, Jr. 4612

5. Unclassified.

Piezoelectric Measurements in Ballistics. H. Illgen 474
Survey of Piezoelectricity. W. G. Cady 5080
Anomalous Charging Current in Rochelle-Salt Crystals. F. Seidl 5081

Luminous Quartz Resonators. F. Galotti 380B
Electrical Equivalent Constants of Piezoelectric Crystals. R. Günther 630B
Modes of Vibration of Piezoelectric Quartz. J. Benoit 1406B
Piezoelectric Measuring Apparatus. R. K. Hellmann 2900B

Planets.

1. General.
2. Major Planets.
3. Asteroids (Minor Planets).
4. Satellites (Moon, etc.).
5. Unclassified.

1. General.

Motion of Nodes and Apsides in Planetary Systems. H. Fabre 512
Absolute Orbits of Planets. H. Fabre 513
Elastic Stability of the Earth. K. Sezawa and K. Kanai 1098
Plastic State of the Earth under Gravitational Forces. K. Sezawa 1099
Liquefaction of the Terrestrial Globe. A. Mercier 1893
Periodic Motion in Celestial Mechanics, and the Variation of Orbital Elements. Part I. H. Fabre 2753
Determination of the Constant of Nutation from the Greenwich Latitude Variation Observations. H. Spencer Jones 2756
Theory of Planets and White Dwarf Stars. A. Sommerfeld 2757
Plastic State of Planets. K. Sezawa and K. Kanai 2758
State of Matter in the Interior of the Planets. R. Wildt 2759
Periodic Motion in Celestial Mechanics, and the Variation of Orbital Elements. Part II. H. Fabre 3134
Origin of the Planets. R. A. Lyttleton 3138
Coordination of Units of Measurement. M. Simonoff 4338
Origin of Planets. J. H. Jeans 4382

Planets, *continued.*

2. Major Planets.

Abstract Nos.
Mercury's Transit across the Corona. B. Lyot 100
Meridian Observations of Jupiter, Saturn, Uranus and the Moon in 1936. L. Gialanella 1510
Venus in Maya Astronomy. A. Dittrich 1511
Significance Tests when Several Degrees of Freedom Arise Simultaneously. H. Jeffreys 1832
South Equatorial Current of Jupiter. A. S. Williams 2327
Possibility of Detecting H_2 and N_2 in Planetary and Stellar Atmospheres by their Rotation-Vibration Spectra. G. Herzberg 2336
Quadrupole Rotation-Vibration Spectrum of H_2. H. M. James and A. S. Coolidge 2337

3. Asteroids (Minor Planets).

Reference Stars for the Opposition of Eros, 1931. H. S. Jones and P. J. Melotte 517
Observations of Eros at the 1931 Opposition with a Preliminary Determination of the Solar Parallax. R. J. Trumpler, F. J. Neubauer, P. H. Hutchings, C. E. Smith and K. P. Kaster 518
Definitive Orbit of Apollo (Reinmuth Object, 1932 HA). F. L. Whipple and L. E. Cunningham 1029
Minor Planet Perturbations. E. Rabe 1512
Minor Planets. A. C. D. Crommelin 1894
Criterion for Identification of Minor Planets. B. de Jekhowsky........ 3139
Minor Planet Hermes. H. Spencer Jones 3586
Photoelectric Light-Curve of Eros. F. E. Roach and L. G. Stoddard........ 4388

4. Satellites (Moon, etc.).

Correlation of Frequencies of Seismic Disturbances with the Hour Angle of the Moon. H. T. Stetson 571
Calculation of the Term in the Motion of the Lunar Perigee with Characteristic e'^4. E. W. Brown 1019
Determination of Longitude by the Azimuth of the Moon. K. Lous 1505
Meridian Observations of Jupiter, Saturn, Uranus and the Moon in 1936. L. Gialanella 1510
Geophysical Lunar Almanac. J. Bartels and G. Fanselau 3140
Photovisual Investigation of the Brightness of 59 Areas on the Moon. A. L. Bennett 3141
Origin of Satellites. R. A. Lyttleton 3576
Problem of Lunar Changes. W. H. Haas 4389
Two New Satellites of Jupiter (J X and J XI). J. Jackson........ 4837

5. Unclassified.

Photoelectric Comparison of Brightness of the Sun, Moon, Capella, Vega and Deneb. W. A. Calder 1071

Polarisation (Radiation).

1. Polarisation by Reflection.
2. Polarisation by Refraction.
3. Polarisation of Scattered Radiation.
4. Rotation of Plane of Polarisation. Rotatory Dispersion. Dichroism.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References:
Effect of Electric and Magnetic Fields, *see* Electro-Optical and Magneto-Optical Effects.
Photoelastic Measurements, *see* Elasticity and Plasticity.
Polarisation of Electric Waves, *see* Oscillations and Waves, Electric.

1. Polarisation by Reflection.

Ellipticity of Light Reflected from Thin Films of Oriented Molecules. H. A. McTaggart 1621
State of Polarisation of the Wave Penetrating into the Second Medium in Total Internal Reflection. S. Gandolfo 4496

Polarisation (Radiation), *continued.*

2. Polarisation by Refraction.

Abstract Nos.
Optical Properties of Polaroid for Visible Light. M. Grabau 670
Polarising Vertical Illuminator. L. V. Foster 2438
Polarised Vertical Illumination. L. V. Foster 2439
Optical Crystallographic Studies with the Polarising Microscope. Part I. W. M. D. Bryant 3063
α-β transformation in Quartz. H. E. v. Steinwehr 3470

3. Polarisation of Scattered Radiation.

Influence of Admixed Gases and of a Magnetic Field on the Degree of Polarisation of the Fluorescence of Iodine Vapour. S. Mrozowski 160
Determination of Real Fluorescence Polarisation of Solutions at High Concentrations. S. I. Wawilow 162
Fluorescence Depolarisation of Solutions at High Concentrations. S. I. Wawilow, P. G. Gluchow and I. A. Khwostkow 163
Double Scattering of Polarised X-Rays. P. Kirkpatrick 671
Polarisation of Raman Lines of Pyrrol, Furane and Thiophene. A. W. Reitz 727
Depolarisation of Light Scattered in Solutions of Electrolytes. K. Hogrebe .. 1622
Reciprocity Theorem in Colloid Optics. R. S. Krishnan 1623
Raman Effect in Gases Under Normal Pressure. J. Cabannes and A. Rousset 1661
Simple Method for Determining the Polarisation of Raman Lines. J. T. Edsall and E. B. Wilson, Jr. 1662
Reciprocity Theorem in Colloid Optics. R. S. Krishnan 2009
Light-Scattering in Emulsions. Part I. R. S. Krishnan 2010
Anomalous Depolarisation of the Light Scattered by Binary Mixtures. B. K. Mookerjee 2873
Quantitative Investigations of the Polarisation of Raman Lines of Crystals. H. Michalke 2914
Determination of Elasto-Optical Constants with Supersonic Waves. H. Mueller 2960
Polarisation of the Resonance Radiation of Sodium Vapour. P. Pringsheim 3272
Fundamental Polarisation and Temperature. A. Jabłoński 3695
Optical Properties of Stratified Cholesteric Substances. J. P. Mathieu 3696
Polarisation of Band Fluorescence of Metal Vapours. S. Mrozowski 4092
Temperature Dependence of the Degree of Depolarisation of Gaseous CO_2, N_2O and C_2H_2. R. Schmidt 4104

4. Rotation of Plane of Polarisation. Rotatory Dispersion. Dichroism.

Theories of Optical Rotatory Power. E. U. Condon 185
Influence of Neutral Salts on the Optical Rotation of Gelatin. Part VI. D. C. Carpenter and F. E. Lovelace 186
Rotatory Dispersion of Unsaturated Secondary Carbinols and Their Corresponding Chlorides. P. A. Levene and A. Rothen 187
Rotatory Dispersion of Alkyl Azides. P. A. Levene and A. Rothen 188
Rotatory Dispersion and Circular Dichroism of *m*-Methyl *cyclo*-Hexanone and of Pulegone in their Ketonic Absorption Bands. T. M. Lowry, D. M. Simpson and C. B. Allsopp 189
Study of Tertiary Amine Oxide Double Bond by Absorption Spectra and Rotatory Dispersion. H. S. French and C. M. Gens 672
Theoretical Consideration of Flow Dichroism. S. Nikitine 673
Optical Rotatory Power of l-Menthol in Heavy Methyl Alcohol. E. Ogawa 1166
Reflection of Circularly Polarised Light by Certain Coleoptera. J. P. Mathieu and N. Faraggi 1624
Dependence of Photodichroism of Bleached Colour Layers on the Illumination. G. Ungar 1625
Solvent Action on Optical Rotatory Power. Part II. Quadrupole Field of the CS_2 Type Molecule. K. Cohen and C. O. Beckmann 1626
Rotatory Dispersion of Sugars in Liquid Ammonia and in Water. H. Shiba and S. Tanabe 2011
Birefringence of Liquids Produced by Supersonic Waves. R. Luças 2102
Half-Shadow Polarimetry. R. Tsuchida 2874
Theory of Photodichroism. S. Nikitine 2875
Properties and Applications of Dichroic Sheet Polarisers. S. Rösch 2876

For the **Key** to this Index see pp. 1182 to 1194.

Polarisation (Radiation), *continued.*

Abstract Nos.

Absolute Configuration of Optically Active Substances. W. Kuhn 2877
New Time Phenomenon in Photographic Emulsions. F. Weigert 3685
Rotatory Power of Quartz in the Far Ultra-Violet and in the Schumann Region. R. Servant 4105
Rotatory Dispersion in the Amine Series. Part IV. W. C. G. Baldwin 4106
Optical Activity of Crystalline $NiSO_4$, α-$6H_2O$. N. Underwood, F. G. Slack and E. B. Nelson 4107
Spectropolarimetry. J. Rabinovitch 4497
Theory of Photodichroïsm. S. Nikitine 4498
Magnetic Anisotropy and Pleochroism of Biotite Mica. P. Nilakantan 4693
Relative and Absolute Configuration of Complex Tridiammino-Ions of Trivalent Cr, Co and Rh. F. M. Jaeger 4924
Photodichroism of Cyanine. S. Nikitine 4925
Birefringence of Quartz under Compression and its U.V. Dispersion. G. Bruhat and A. Blanc-Lapierre 4930

6. Unclassified.

Plane Polarised Waves in the General Theory of Relativity. N. Rosen 477
Polarisation of Light Transmitted by Colloidal Solutions. A. Boutaric and L. Bernard 912
Effect of Polarised Light on the Brownian Movement. J. Kolb, A. Deubner, R. Fürth 1828
Polarisation of Light Emitted from Canal Rays. H. Angenetter and H. Verleger 2461
Wave and Geometrical Optics. S. M. Rytov 3699
Physics in Pharmacy. R. L. McFarlan 4563

Pressure.

1. Measurements.
2. Apparatus, *see* Supplementary Index.
3. Unclassified.

Cross-References :
Effects of Pressure, *see also* appropriate Key Headings.
P.V.T. Relations, *see* Thermodynamics

1. Measurements.

Compressibilities of Fourteen Substances to 45,000 kg./cm^2. P. W. Bridgman 1798
Polymorphic Transitions up to 50,000 kg./cm^2. of Several Organic Substances. P. W. Bridgman 1799
Adiabatic Compressibility of Liquids. J. Villey 1810
Resistance of Metals under Pressure. P. W. Bridgman 2135
Extreme Pressures and their Importance in the Investigation of Engineering Problems. T. C. Poulter 2721
Tension Experienced by an Ellipsoidal Balloon Envelope. L. Lecornu 3099
Measurement of Pressures upon a Body Rotating in the Air. E. Brun 3536
Plastic Deformation of Pb, Cu and Al Under Static Compression. W. J. Lyons 4318

3. Unclassified.

Phosphorus at High Temperatures and Pressures. R. B. Jacobs 9
Effect of Pressure on the Refractive Index of CO_2. A. Michels and J. Hamers 194
Melting of Mononitrophenols at High Pressure. R. B. Dow and H. B. Hibshman 248
Influence of Pressure on the Curie Point of Ni-Cu Alloy. A. Michels, A. Jaspers, J. de Boer and J. Strijland 356
Phase Diagram of Water to 45,000 kg./cm^2. P. W. Bridgman 781
Calculation of Temperatures and Pressures of Combustion in a Closed Vessel. G. Ribaud 785
Effect of Hydrostatic Pressure on the Susceptibility of Rochelle Salt. D. Bancroft 2142

Vacuum Measurement by Ionic Current. G. Herrmann and I. Runge 772B
Direct Reading High Sensitivity Membrane Vacuum Gauge. C. Brinkmann 773B

Pressure, *continued.*

Abstract Nos.

Low Pressure Measurement with Ionisation Gauge. R. H. Healy and J. W. Reed ... 774B
Energy Content of Gases at High Pressures. E. W. Geyer ... 2852B

Radiation, Emission.
Radiation, General Theory.
Radiation, Mechanical Effects.
See **Emission (Radiation).**

Radioactivity.

1. Theory.
2. Radioactive Substances and Transformations.
3. Induced Radioactivity and Artificial Disintegration.
4. α-Rays.
5. β-Rays.
6. γ-Rays.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References:
Isotopes, *see also* Atomic and Molecular Structure.
Neutrons and Positrons, *see also* Electrons, etc.

1. Theory.

Statistical Character of Radioactive Decay Law and Collision Frequency Distribution in Ionisation Chamber. E. Schüttlöffel ... 134
Extreme Intervals Between Radioactive Emissions. Part II. E. J. Gumbel 589
Nuclear Selection Rules. C. D. Ellis ... 1113
Nuclear Structure of Light Atoms. B. M. Sen ... 1367
Nuclear Disintegrations. T. Kahan ... 2819
Nuclear Structure of Radioactive Substances. U. C. Bardhan ... 2820
Highly Activated Atomic Nuclei. L. Goldstein ... 4052
Nuclear Excitation and Partitio Numerorum. K. Umeda ... 4053
Theory of Radioactivity, Natural and Artificial, Based on Nuclear Constitution. A. Véronnet ... 4054
Theoretical Method in Radioactivity. M. Ferber ... 4445
Method of Calculating Fluctuations. R. Ellickson ... 4789

2. Radioactive Substances and Transformations.

Optimum Counting-Time for Measuring the Intensity of a Radioactive Source. J. Tandberg ... 135
Age of the Sun, Disintegration Constant of Ac U and the Mass Proportions Pb to Th to U on the Earth. S. Meyer ... 542
Deposition of Radioactive Elements from the Air by Aliverti's Method. G. Rosa ... 554
Influence of the Absorption in the Interior of a Radioactive Preparation on the Radiation Emitted. M. Holuba ... 590
Chemical Investigation of Short-lived Artificial Radio-elements. A. Polessitsky ... 591
Identification of Ra, MsThI and RdTh in Sealed Preparations. G. V. Gorškov and V. N. Ionov ... 592
Mechanical Moment of the Sr^{87} Nucleus and the Radioactivity of Rb^{87}. M. Heyden and H. Kopfermann ... 723
Microcalorimeter-Thermostat for Heat Development at Radioactive Minerals. N. v. Szentpály ... 757
Atomic Weight of Lead and Pb/U Ratio in St. Joaquimsthal Pitchblende. G. P. Baxter and W. M. Kelley ... 909
Ionisation Balance and Amount of Radium Emanation in the Atmosphere. J. Clay and L. J. L. Dey ... 1565
Radioactivity of Potassium. A. Bramley and A. K. Brewer ... 1947
Radon Content of Tap-Water. G. J. Sizoo and C. P. Koene ... 1948
Uranium Z and Nuclear Isomerism. N. Feather and E. Bretscher ... 1949
Radioactivity of Mineral Springs. H. Pertz ... 2385
Age of the Sun and Disintegration Constant of AcU. Part II. S. Meyer ... 2781
Atmospheric Radioactivity. G. Aliverti ... 2821
Ra and Rn Content of Pacific Ocean Water, Life and Sediments. Robley D. Evans, A. F. Kip and E. G. Moberg ... 4422
Radon Condensation Method of Determining Geologic Age. N. B. Keevil .. 4446
Disintegration Constant of Th and Branching Ratio of ThC. A. F. Kovarik and N. I. Adams, Jr. ... 4447

Radioactivity, *continued.*

Abstract Nos.
Radium Content of Marine Sediments. Robley D. Evans and A. F. Kip 4852
Naturally Radioactive Elements. W. Minder 4881
Existence of Thorium-Polonium. J. Schintlmeister 4882

3. Induced Radioactivity and Artificial Disintegration.

Mean Free Path of Transformation Particles, Masses of Light Nuclei, and Verification of Absorption Theories. G. Mano 11
Absorption of β-Rays in Rubidium. Z. Ollano 136
Potassium-Argon Transformation. A. Bramley 137
Ionising Power of Li-Particles. F. Kirchner, H. Neuert and O. Laaff 138
Radioactive Isotopes of Bromine. A. H. Snell 139
Disintegration of Be and Masses of Be Isotopes. J. H. Williams, R. O. Haxby and W. G. Shepherd 140
Neutrons from the Disintegration of Nitrogen by Deuterons. W. E. Stephens, K. Djanab and T. W. Bonner 141
Longest Range Proton Group in the Disintegration of Boron by α-Particles. H. Maier-Leibnitz and W. Maurer 142
Transmutation of B^{10} into C^{13}. W. Bothe and H. Maier-Leibnitz 143
Transmutation Function for Deuterons. P. L. Kapur 144
Radioactivity of Nickel, Copper and Zinc. F. A. Heyn 145
Cloud Chamber for Nuclear Disintegration Studies. H. R. Crane 152
Angular Distribution of Protons Projected by Fast Neutrons. P. I. Dee and C. W. Gilbert 334
Range and Angle of Projection for Protons in Photo-Disintegration of Deuterium. J. Chadwick, N. Feather and E. Bretscher 335
Nature of Interaction between Neutron and Proton from Scattering Experiments. H. S. W. Massey and R. A. Buckingham 336
Recent Results of Experimental Nuclear Investigations. R. Fleischmann .. 388
Nuclear Transformations and Cosmic Radiation. W. Bothe, W. Gentner, H. Maier-Leibnitz, W. Maurer, E. Wilhelmy and K. Schmeiser 593
Nuclear Disintegrations Produced by Cosmic Rays. R. B. Brode and M. A. Starr 594
Resonance Effects in (α, n) Nuclear Transformation. E. Fünfer 595
Ionising Power of Atomic Nuclei Emitted in Nuclear Transformation Processes. F. Kirchner, H. Neuert and O. Laaff 596
Nuclear Reaction Be (α, n). New Method of Determining the Mass of the Neutron. J. Crussard and S. Gorodetzky 597
Energies of Electrons and Positrons Emitted in Certain Nuclear Reactions. C. Magnan 598
Disintegrations Induced by High-Energy Electrons. J. Solomon 599
Excitation Function and Energy Distribution of Neutrons Emitted from Boron by Bombardment with α-Particles from Po. W. Maurer 600
Production of Neutrons by Bombardment of Beryllium with α-Particles. T. Bjerge 601
Resonance Emergence of Protons and α-Particles. E. Wilhelmy 602
Artificial Radioactivity Produced by Slow Neutrons on Sb. K. Alexeeva .. 603
Artificial Radioactivity of Tantalum. O. Oldenberg 604
Radioactivity in Silver Induced by Fast Neutrons. M. L. Pool 605
Lecture Apparatus for Artificial Disintegration using Canal Rays. R. Döpel 615
Design and Operation of a Large Cyclotron. M. C. Henderson and M. G. White 617
Artificial Disintegration and Radioactivity. G. Guében 1111
Oppenheimer-Phillips Process (Nuclear Reactions). H. A. Bethe 1112
Radiations Emitted from Artificially Produced Radioactive Substances. Part IV. γ-Rays from Several Elements. J. R. Richardson 1114
Neutrons from Lithium Plus Deuterons. W. E. Stephens 1115
Slow Neutron Disintegration of B^{10} and Li^6. M. S. Livingston and J. G. Hoffman 1116
Photodisintegration of the Deuteron by the γ-Radiation from Na^{24}. J. R. Richardson and L. Emo 1117
Short Ion-Path H.V. Tube. W. E. Stephens and C. C. Lauritsen 1275
Nuclear Photo-Effects. N. Bohr 1368
Angular Distribution in Nuclear Transitions. C. Reinsberg 1568
Approximately Relativistic Equations. G. Breit 1569
Long Period Activity of Indium Produced by Slow Neutrons. A. C. G. Mitchell 1570

For the **Key** to this Index see pp. 1182 to 1194.

Radioactivity, *continued.*

Abstract Nos.

K-Electron Capture and Isomerism in Radiosilver. M. L. Pool and E. C. Campbell 1571
Emission of Neutrons from A, Cl Al and Heavier Elements under α-Particle Bombardment. E. Pollard, H. L. Schultz and G. Brubaker 1572
Production of N^{13}. R. B. Roberts and N. P. Heydenburg 1573
Disintegration of Nuclei by Cosmic Rays. A. Filippov, A. Gdanow and I. Gurevich 1574
Artificial Radioactivity Produced by Cosmic Rays in Lead and Iron. J. Clay and K. H. J. Jonker 1575
Nuclear Isomers of In^{116}. A. C. G. Mitchell and L. M. Langer 1764
Radioactivity Induced in the Rare-Earth Elements by Fast Neutrons. M. L. Pool and L. L. Quill 1950
Proton Induced Radioactivities. L. A. DuBridge, S. W. Barnes, J. H. Buck and C. V. Strain 1951
Energy of Protons Emitted in the Transmutation of Boron by α-Particles. F. Joliot and I. Zlotowski 1952
Radioactivity Induced by Neutrons in Ruthenium. H. de Vries and J. Veldkamp 1953
Identification and Measurement of Helium Formed in Beryllium by γ-Rays. E. Glückauf and F. A. Paneth 1954
Occurrence of Helium in Beryls. J. W. J. Fay, E. Glückauf and F. A. Paneth 1955
Disintegration of the Deuteron by α-Particles. H. L. Schultz 1956
γ-Radiation from Boron Bombarded by Protons. W. A. Fowler, E. R. Gaerttner and C. C. Lauritsen 1957
Boron Plus Proton Reactions. J. R. Oppenheimer and R. Serber 1958
Focusing in the Cyclotron. M. E. Rose 1963
Focusing in the Cyclotron. R. R. Wilson. 1964
Use of an Ionisation Chamber with a Liquid Dielectric. L. Goldstein and A. Rogozinski 1965
Electrostatic Generator Operating under High Air Pressure-Operational Experience and Accessory Apparatus. D. B. Parkinson, R. G. Herb, E. J. Bernet and J. L. McKibben 2162
Radioelement of Period 3·5 Hours Formed from Uranium Irradiated by Neutrons. I. Curie and P. Savitch 2386
Disintegration Periods of the Radio-Silvers. A. Moussa and H. Laurent 2387
Artificial Activity of Radio-Aluminium (^{26}Al) and Radio-Chlorine (^{34}Cl). H. Brandt 2388
Comparison of Intensities of Various Radioactive Elements Produced by Slow Neutron Bombardment. A. Baschwitz 2389
Disintegration of Boron by Slow Neutrons. J. C. Bower, E. Bretscher and C. W. Gilbert 2390
Fast Neutrons. M. L. Pool 2391
Formation of an Excited He^3 in the Disintegration of Deuterium by Deuterons. T. W. Bonner 2392
Magnetic Field Corrections in the Cyclotron. M. E. Rose 2393
Cross-Sections for Reactions between Very Light Nuclei. S. Flügge 2394
Dispersion Formula for Nuclear Reactions. P. L. Kapur and R. Peierls 2395
Collision of Deuterons with Heavy Nuclei. Part I. E. Lifshitz 2822
Disintegration of Deuterons by Deuterons. J. Kreisler 2823
Yield and Energy of the Neutrons Produced in the Reaction $D^2_1+D^2_1=He^3_2+n^1_0$. E. Baldinger, P. Hubert and H. Staub 2824
Formation of $^5_2$He by Collisions between Helions and Deuterons. F. Joliot and I. Zlotowski 2825
Loss of Neutrons by Neutron Bombardment and the Radioactive Isotopes of Scandium. J. M. Cork and R. L. Thornton 2826
Range-Distribution of α-Particles from ^{8}Li. C. L. Smith and W. Y. Chang .. 2827
γ-Ray Activity Induced in Cadmium by Slow Neutron Bombardment. S. Nakagawa and I. Sumoto 2828
Intensity of γ-Radiation Produced by Slow Neutrons. R. D. Hill and A. A. Townsend 2829
Artificial Radioactivity. Part III. K. Diebner and E. Grassmann. 3192
Radioelement of Period 3·5 hr. Formed in Uranium Irradiated with Neutrons. I. Curie and P. Savitch 3193
Radio-Arsenic. P. Harteck, F. Knauer and W. Schaeffer 3194
Radioactive Isotopes of Iron. J. J. Livingood and G. T. Seaborg 3195

Radioactivity, *continued.*

Abstract Nos.

Neutrons by α-Particle Bombardment of Light Elements. C. S. Copeland and S. C. Lind 3196

Disintegration of Boron by Slow Neutrons. C. O'Ceallaigh and W. T. Davies 3197

Excitation Function for the Disintegration of Li^7 by Low Energy Protons. L. J. Haworth and L. D. P. King 3198

Stopping Power of Li for Low Energy Protons. L. J. Haworth and L. D. P. King 3199

Excitation Mechanism in Atomic Nuclei. L. Goldstein 3631

Excitation of Nitrogen Nuclei by Rapid Neutrons through Paraffin. J. Thibaud and P. Comparat 3632

Excitation Function of the (α, n)-Transformations of N, Al and A. E. Fünfer 3633

Theory of Excitation Functions on Basis of Many-Body Model. E. J. Konopinski and H. A. Bethe 3634

Periods of Radioactive Silver Isotopes. A. Moussa and H. Laurent 3635

Long-Period Radioactivity in Ag, Cs and In Activated by Slow Neutrons. K. Alexeeva 3636

Disintegration of Boron. I. Zlotowski 3638

New Transformation Product of Long Life in the Trans-Uranium Series. O. Hahn, L. Meitner and F. Strassmann 3639

Artificial Disintegration of Th with Neutrons. L. Meitner, F. Strassmann and O. Hahn 3640

Yield of α-Particles from Be Bombarded by Protons. G. T. Hatch 3641

Energy Change in Be-Li Transmutation by Proton Bombardment. S. K. Allison, L. S. Skaggs and N. M. Smith, Jr. 3642

Resonance Levels of Nitrogen Excited by Rapid Neutrons. J. Thibaud and P. Comparat 4055

Angular Distribution of Resonance Disintegration Products. R. D. Myers 4056

Radioactive Cd. M. Dodé and B. Pontecorvo 4057

Radio-Silicon Produced by Bombardment of Sulphur with Rapid Neutrons. J. Cichoki and A. Soltan 4058

Artificial Radioactivity as a Test for Minute Traces of Elements. G. T. Seaborg and J. J. Livingood 4059

Intermittent Amplifier for Rapid Counting of Geiger-Müller Impulses. L. Kowarski and S. Winter 4064

H.F. Multiple Accelerators. E. O. Schlosser 4065

Transmutations and High Voltages. M. Pauthenier 4066

D.C. Production at High Voltage. R. Planiol 4067

Composition of Matter. R. Grégoire 4271

Separation of Isotopes for Investigation of Nuclear Transformations. E. L. Yates 4273

Extension of Periodic Table and Elements beyond Uranium. P. Ray 4274

Decay Constant of P^{32}. N. B. Cacciapuoti 4448

Neutron Disintegration of Be and B by Bombardment with α-Particles from Po. G. Bernardini 4449

Beryllium Isotope of Mass 8. O. Laaff 4450

Radioactive Mn Isotopes. J. J. Livingood and G. T. Seaborg 4451

γ-Rays from F Due to Proton Bombardment. E. J. Bernet, R. G. Herb and D. B. Parkinson 4452

Transmutation of Ti by ThC′ α-particles. W. L. Davidson, Jr. and E. Pollard 4453

Transmutation of Sc by ThC′ α-Particles. E. Pollard 4454

Transmutation of F by Protons and Deuterons. W. E. Burcham and C. L. Smith 4455

Capture of Orbital Electrons by Nuclei. L. W. Alvarez 4456

Report on the Work of the Bartol Research Foundation, 1937–1938. W. F. G. Swann 4482

Action of Thermal Neutrons on Aluminium. P. Wang 4678

Production of Long-Lived Radioactive Co Isotope from Ni Bombarded by Fast Neutrons. O. Viktorin 4883

Disintegration of Carbon by Fast Neutrons. H. Aoki 4884

Disintegration of Fluorine by α-Particle Bombardment. N. K. Saha 4885

Artificial Disintegration of Ne. K. Gailer 4886

Angular Distribution in Nuclear Transitions. C. Reinsberg 4887

Nuclear Transformations Produced in Zinc by α-Particle Bombardment. W. B. Mann 4888

Nuclear Transmutations of Li Isotopes. L. H. Rumbaugh, R. B. Roberts and L. R. Hafstad 4889

For the **Key** to this Index see pp. 1182 to 1194.

Radioactivity, *continued.*

Abstract Nos.

K-Electron Capture in Be^7. G. Breit and J. K. Knipp 4890
Cyclotron and its Applications. J. Chadwick 4900
Paths of Ions in the Cyclotron. Part I. Orbits in the Magnetic Field. Part II. Paths in Combined Electric and Magnetic Fields. L. H. Thomas 4901
Production of Collimated Beams of Monochromatic Neutrons in the Temperature Range 300°–10° K. L. W. Alvarez 5055

4. α-Rays.

Reflection of α-Particles of RaC′ by Heavy Atomic Nuclei. K. Krammer 146
Number of α-Particles Emitted by Active Deposit of Thorium. A. Ricoux 147
Fluctuations in the Range of Corpuscular Rays. S. Titeica 606
Electric Charge of α-Particles in Helium. F. Viehfeger 607
Collisions of α-Particles with Neon and Deuterium Nuclei. J. T. McCarthy 608
Range of Thorium α-Rays. J. Schintlmeister 1118
Dependence of the Range of α-Particles from Po on the Type of Source. J. Schintlmeister 1119
Scattering of α-Particles from Po by Heavy Nuclei and the Emission of Particles of Short Range. W. Jentschke and G. Stetter. H. Pettersson and J. Schintlmeister 1120
Independent Disintegration of Polonium Atoms. J. Thibaud and M. Ferber 1121
Determination of Radium Content of Rocks by Direct α-Ray Counting. J. H. J. Poole 1122
Theoretical Efficiency of Cylindrical Ionisation Chambers for Estimating Radon by α-Particle Counting. J. H. J. Poole 1124
Emission of α-Particles. J. Brenet and H. Armand 1959
Effect of Electric Fields on the Decomposition of Ammonia by α-Rays. C. Smith and H. Essex 1960
Numbering α-Particles by their Photographic Action. F. Halbwachs 2396
Corpuscular Rays. Part II. A. Becker 2552
Binding Energy of the Atomic Nucleus and α-Decay. V. Cherdynzev 2830
Decomposition and Synthesis of HI by α-Particles. K. G. Brattain 3200
Range and Specific Ionisation of α-Particles. M. G Holloway and M. S. Livingston 3201
Anomalous Scattering of α-Particles. H. S. W. Massey and C. B. O. Mohr 3643
Variation of Ionisation with Range of α-Particles, Protons, Deuterons and ^3H Particles. J. C. Bower 3644
Re-Emission of α-Particles Absorbed by Light Nuclei. F. Perrin, N. Bohr 4060
Observation of α-Rays on Irradiation of Th and U with Ra + Be-Neutrons. G. F. v. Droste 4061
Disintegration of Po. M. Ferber 4062
Improved Ionisation Chamber for α- and H-Rays. J. Schintlmeister 4068
Variational Theory of the α-Particle. H. Margenau and W. A. Tyrrell, Jr. 4457
α-Particle Model of the Nucleus. L. R. Hafstad and E. Teller 4735
Decomposition and Synthesis of HI by α-Particles. K. G. Brattain 4891
α-Rays from Mesothorium 2. E. Rona and J. Schintlmeister 4892
Natural H-Rays. J. Riedl 4893

5. β-Rays.

Diffraction of β-Rays. S. C. Curran 339
Continuous β-Spectrum of RaE. A. Flammersfeld 609
β- and γ-Radiation. J. Surugue 610
Absorption Limits for the Primary β-Particles of Mesothorium 2 and Uranium X_2. N. Feather 611
Scattering of Fast β-Particles in Nitrogen. Part I. E. G. Stepanowa 1124
Coefficient of Absorption of Uranium Y β-Rays. Z. V. Erchova 1125
Continuous β-Ray Spectrum of Thorium B. R. Arnoult 1126
Reflection of β-Rays. J. A. Chalmers 1127
Upper Limits of Continuous β-Ray Spectra. E. E. Widdowson and F. C. Champion 1128
Anomalous Scattering of Fast Electrons. D. Masurenko 1310
Intensities of the Principal Conversion Electron Rays of the Active Deposit of Thoron and the Photographic Efficiency of Electrons. R. Arnoult 1576
Low Energy Region of the β-Spectrum of RaE. A. I. Alichanian and A. S. Zavelskij 1577

Radioactivity, *continued.*

Abstract Nos.

Low Energy Region of the β-Spectra of ThB$''$ and ThB. A. I. Alichanian and A. S. Zavelskij 1578
Amplitude Factor in β-Decay. K. Umeda 1579
Spin Change in the Radioactive β-Decay of ^{87}Rb into ^{87}Sr. M. Heyden and H. Kopfermann 1580
Complete Detection of β-Particles. S. C. Curran 1581
Exchange Character of Nuclear Forces from the β-Decay Theory. K. Nakabayasi 1961
Evidence against the Existence of Heavy β-Particles. A. Ruark and C. C. Jones 1962
Theory of Neutrinos. G. Wataghin 1977
β-Spectra. M. Lecoin 2397
Directional Distribution in β-Decay. I. I. Predmestnikow 2398
Internal Conversion Electrons of Actinon. W. E. Bennett 2399
Improved Method for the Determination of the Specific Charge of β-Particles; Specific Charge of Disintegration Electrons from RaE. C. T. Zahn and A. H. Spees 2591
Critical Analysis of the Classical Experiments on the Relativistic Variation of Electron Mass. C. T. Zahn and A. H. Spees 2592
Upper Limit of Energy of the Continuous β-Spectrum of the Radioelements. A. Baschwitz 2831
Absorption of β-Rays of Radioelements. M. E. Nahmias and L. I. Schiff 2832
Absorption and Diffusion of β-Rays in Cellulose Acetate. R. Arnoult 2833
Emission of Ionising Radiation by Dried Plants. F. Artigas 2834
β-Transitions in a Coulomb Field. F. Hoyle 2835
New Experimental Evidence for the Existence of a Neutrino. H. R. Crane and J. Halpern 2843
Absorption and Coincidence Experiments on the Radiations from the Radioactive Sodium, Na^{24}. N. Feather and J. V. Dunworth 3637
Theory of β-Decay. M. H. Hebb 3645
Production of Positron-Electron Pairs during the Passage of β-Particles through Matter. N. Feather and J. V. Dunworth 3646
β-Spectrum of RaE near the Upper Limit and Mass of the Neutrino. A. Alichanian, A. Alichanov and B. Dželepov 4458
β-Spectrum of ThC near the Limit and Mass of the Neutrino. A. Alichanian and S. Nikitin 4459
Scattering of Fast β-Particles by Mercury Nuclei. A. Barber and F. C. Champion 4673
Absorption Method of Investigating Primary β-Particles from Radioactive Substances. N. Feather 4894

6. γ-Rays.

Air Equivalent of γ-Radiation. R. Schulze and W. Minder 148
Relative Efficiency of Tube Counters of Different Materials Under the Action of Hard γ-Rays. K. Buchmann 149
Absorption and Scattering of Hard γ-Rays. W. Gentner 150
Angular Distribution of Pairs Produced in Pb by Penetrating or Hard γ-Radiation. H. Adam, G. Burkhardt 333
Quantum-Counter Amplifiers for γ-Ray Detection, and Applications to Studies in Radium Poisoning. Robley D. Evans 362
Radiating Surfaces. Part II. J. van Roojen 363
β- and γ-Radiation. J. Surugue 610
Energy of γ-Rays from Penetration of Secondary Electrons. G. Bernardini and S. Franchetti 612
Photonuclear Absorption of Hard γ-Rays. J. Rotblat 613
Efficiency of a γ-Ray Counter. G. J. Sizoo and H. Willemsen 1129
Ionisation and Conductivity in Gases at High Pressures. J. Clay 1266
Absorption of Radium γ-Rays. G. J. Sizoo and H. Willemsen 1582
Production of γ-Rays by Neutrons. E. H. S. Burhop, R. D. Hill and A. A. Townsend 1583
Diffraction Spectrography of γ-Rays of Actinium and its Derivatives. M. Frilley 2400
Eve Constant. R. Schulze 2401
Parabolic Relation between Flow of Electricity in Regions of Low Atmospheric Pressure and Ionisation by γ-Rays. H. Mache and O. Moszkowicz 2809

For the **Key** to this Index see pp. 1182 to 1194.

Radioactivity, *continued*.

Abstract Nos.

Electric Currents and Counter E.M.F.'s in Paraffin Wax in the Natural State and Subjected to γ-Radiation. W. Ścisłowski 2983
Formation of Positron-Electron Pairs. K. Zuber 3004
Stability of Nuclear Isomers. M. H. Hebb and G. E. Uhlenbeck 3044
γ-Ray Ionisation Currents in Air at High Pressures and High Gradients. J. W. Broxon and G. T. Merideth 3202
Analysis of High Gradient, High Pressure, γ-Ray, Air Ion Current Measurements, by Zanstra's Adaptation of Jaffé's Columnar Theory. J. W. Broxon and G. T. Merideth 3203
U.V. Radiation of Crystals under the Action of γ-Rays. E. K. Zavadovskaya 3216
Structure of Atomic Nuclei. F. J. de Wiśniewski 3434
Probability of Pair Creation in Kr by γ-Rays. L. V. Grošev and I. M. Frank 3647
Angular Distribution of Pairs in Kr. L. V. Grošev and I. M. Frank 3648
Nuclear Impulse in Pair Creation. L. V. Grošev and I. M. Frank 3649
γ-Radiation from Actinium. E. Kara-Michailova 3650
γ-Ray Ionisation in Gases at High Pressures. J. Clay and M. Kwieser 3651
Dependence of Ionisation by Penetrating- and γ-Radiation upon Pressure. J. Clay 3652
Neon Lamp as γ-Ray Counter. G. Lovera 4063
γ-Ray Measurement. W. Friedrich 4255
γ-Ray Measurement. G. W. C. Kaye and W. Binks 4256
Angles between the Components of a Pair. A. Alichanian, B. Dželepov and P. Spivak 4460
Application of Clay's New Value of the Jaffé-Zanstra Coefficient for Air to High Pressure Ion Current Measurements. J. W. Broxon and G. T. Merideth 4895

8. Unclassified.

Range of H-Rays by the Photographic Method. M. Blau and H. Wambacher 618
Luminescence and Colour Excited by Radium in Glasses. B. E. Cohn and S. C. Lind 1993
Investigation of Surface Phenomena by Radioactive Methods. O. Hahn 3559
Distribution of RaD(Pb) between Crystals and Solutions of $Ba(IO_3)_2$. A. Polessitsky 3965
Distribution of Minute Amounts of Material between Liquid Phases. D. C. Grahame and G. T. Seaborg 4814
Effects of Radiation on Oil. W. Stenstrom and I. Vigness 4973

Reflection, Refraction and Dispersion (Radiation).

1. Reflection. Reflecting Power.
2. Geometrical Optics. Optical Imagery.
3. Aberration (Spherical and Chromatic), Tests for Definition, Distortion, Astigmatism, etc.
4. Refraction and Dispersion.
5. Glasses, Optical Media and Materials.
6. Apparatus, *see* Supplementary Index.
    - (*a*) Mirrors, Microscopes and Telescopes.
    - (*b*) Refractometers.
    - (*c*) Goniometers.
    - (*d*) Projectors (Lighthouses, Lanterns, etc.).
    - (*e*) Lenses, Objectives, Prisms, Eyepieces.
7. Unclassified.

Cross-References :

Double Refraction in Magnetic and Electric Fields, *see* Electro-Optical and Magneto-Optical Effects.
Electric Waves, *see* Oscillations and Waves, Electric.
γ-Rays, *see* Radioactivity.
Meteorological Optics, *see* Meteorology.
Photoelastic Measurements, *see* Elasticity and Plasticity.
X-Ray Reflection, etc., *see* X-Rays.

1. Reflection. Reflecting Power.

Computation of Optical Constants. J. B. Nathanson 190
Reflectivity of Corrugated Surfaces. L. S. Ornstein and A. van der Berg 192
Optical Constants of Rhodium. M. Auwärter 675
Structure and Optics of Evaporated Metal Films. G. Hass 1490
Variation of Reflecting Power with Temperature. L. S. Ornstein and O. Koefoed 1628
Transformation Temperature of a Metallic Film. Part II. T. Fukuroi 1865
Reflection of Plane Wave Pulses from Plane Parallel Plates. M. Muskat 2013
Optical Properties of Thin Pt Films. P. Rouard 2441
Reflection and Absorption of Visible Radiation in the System KCl-$CuCl_2$. G. Glockler and R. E. Dietmeier 2442

Reflection, Refraction and Dispersion (Radiation), *continued.*

Abstract Nos.
Reflection by Crystals in Far Ultra-Violet. G. Rathenau ... 2443
Optical Constants, Electrical Resistance and Structure of Thin Metal Films. J. Krautkrämer ... 3468
Visible and U.V. Reflection Spectra of Solids. M. Billy and A. Berton ... 3718
Reflection Factor of Clothing. P. Moon and M. S. Cettei ... 4108
Experimental Determination of the Optical Constants of Metals. J. B. Nathanson ... 4109
Determination of Optical Constants by the Optical Pyrometer. A. G. Worthing ... 4110
Optical Properties of Alkali Metals. R. W. Wood and C. Lukens ... 4111
Reflection Spectra of Solid Organic Substances. T. Guilmart ... 4131
Photographic Colorimetry of Dark Surfaces. E. v. Angerer and J. O. Brand 4467
Apparatus for Testing Highway Sign Reflection Units. R. Kingslake ... 4495
Optics of Head-lights. J. H. Nelson ... 4501
Reflection and Transmission Coefficients of Very Thin Metallic Layers. P. Rouard ... 4502
U.V. Absorption Spectra by Reflection. T. Guilmart and R. Freymann ... 4949
Optical Properties and Photoelectric Emission in Thin Alkali Metal Films. H. E. Ives and H. B. Briggs ... 5078

2. Geometrical Optics. Optical Imagery.

Optical Constants of Rubidium and Caesium. H. E. Ives and H. B. Briggs 191
Geometrical Theory of the Spherical Mirror. J. Flügge ... 676
Determination of Long Focal Lengths. H. Schulz ... 1629
Brightness-Distribution in Image-Plane of Photographic Objectives. K. Pritschow ... 2435
Thick Lenses. F. Record ... 2444
Correct Projection of Fluted Films. J. de L. Saint-Genies ... 3235
Tolerances Permissible in Flats for Autocollimation Tests. C. R. Burch ... 3572
Adjustments and Measurements by Means of Images Obtained by Multiple Reflections. A. Guillet ... 3698
Wave and Geometrical Optics. S. M. Rytov ... 3699
Centres and Foci. I. Koukles ... 3953
Precision Measurements with the Micrometer Eyepiece. H. Rühle ... 4332
Optical Spherometer for Non-Reflecting Surfaces. C. S. Venkateswaren ... 4334
Stereoscopic Drawings. J. T. Rule ... 4569
Dioptrics of Aiming Telescope. H. Schulz ... 4928
Vision through Optical Instruments. T. Smith ... 4967

3. Aberration (Spherical and Chromatic), Tests for Definition, Distortion, Astigmatism, etc.

Mirror Systems. H. Schulz ... 677
Distortion-Free Mounted Lenses. J. Picht ... 678
Optical Paradox. M. Herzberger ... 1167
Harting's Criterion for Complete Achromatism. F. H. Perrin ... 1630
Freedom from Aberration with Individual Lenses. H. Schulz ... 2880
Optical Paradox. H. W. Lee ... 3236
Glass Estimation for Achromatic Lenses. H. Schulz ... 4929

4. Refraction and Dispersion.

Refractivity Intercept. S. S. Kurtz, Jr., and A. L. Ward ... 193
Effect of Pressure on the Refractive Index of CO_2. A. Michels and J Hamers 194
Birefringence Due to Compression of Quartz. G. Bruhat and A. Blanc-Lapierre ... 195
Dispersion without Deviation of the Mean Ray. H. W. Farwell ... 196
Refractive Dispersion of Organic Compounds. Part IX. Optical Exaltation in Unsaturated Hydrocarbons with Conjugated Double Bonds. T. M. Lowry and C. B. Allsopp ... 197
Isotopic Constitution of Snow and Mountain River Water. A. E. Brodsky, O. C. Scarre, E. I. Donzowa and M. M. Sluckaia ... 395
Refractivity Intercept. Part II. S. S. Kurtz, Jr., and A. L. Ward ... 679
Anomalous Dispersion in the First Doublets of Cu and Au. L. Allegretti ... 680
Anomalous Dispersion of Didymium Glass. K. Prosad and R. P. Gupta ... 681

For the **Key** to this Index see pp. 1182 to 1194.

Reflection, Refraction and Dispersion (Radiation), *continued.*

Abstract Nos.

Dipole Moments of Aromatic Diazoamino-Compounds. R. J. W. Le Fèvre and H. Vine ... 830
U.V. Dispersion Measurements. V. Holbro ... 1168
Optical Constants of Very Thin Metal Films. K. Försterling ... 1169
Classical Optics. E. Buchwald ... 1170
Properties of Carbon-Halogen Bond in Aliphatic Compounds. J. M. Stevels 1375
Refraction of Halogenated Methane Derivatives Containing One or More Nitro Groups. J. M. Stevels ... 1631
X-Ray Spectra, Double Refraction and Viscosity of Sols in Motion. K. Hess, H. Kiessig and W. Philippoff ... 1784
Influence of Temperature and Pressure on the Volume and Refractive Index of Benzene. R. E. Gibson and J. F. Kincaid ... 1811
Refractive Index and Dispersion of Distilled Water for Visible Radiation, at Temperature 0 to 60° C. L. W. Tilton and J. K. Taylor ... 2014
Birefringence of Liquids Produced by Supersonic Waves. R. Lucas ... 2102
Structure of Dental Enamel. M. Harders-Steinhäuser ... 2243
Density and Refractive Index of Very Dilute, Aqueous Solutions of Strong Electrolytes. W. Prang ... 2250
Refractive Index and Molecular Refraction of H$_2$S and D$_2$S. O. E. Frivold, O. Hassel and E. Hetland ... 2445
Dispersion and Optical Anisotropy of Molecular Oxygen in Relation to its Absorption Spectrum. P. Pattabhiramayya ... 2446
Refractive Index of Interstellar Space. E. Schoenberg ... 2776
U.V. Dispersion of Water between 6° and 35°. M. Bayen ... 2881
Optical Crystallographic Studies with the Polarising Microscope. Part I. W. M. D. Bryant ... 3063
U.V.Refraction-Dispersion of D$_2$O. M. Bayen ... 3237
Negative Dispersion in Electrically Excited He. M. Kruse ... 3238
Influence of Strain on Refractive Index of Glass. N. Winter-Klein ... 3700
Relative Refractive Index of Two Liquids by Photography. H. O. Kneeser. 3701
Refractive Index of Air in the Visible and Photographic Infra-Red. D. Bender ... 3702
Refractive Indices of Liquid He I and He II. H. E. Johns and J. O Wilhelm 4112
Ray-Surface and Optical Indicatrix. G. Tunell ... 4113
Double Refraction of Anisotropic Liquids. W. Kast ... 4305
Physical Properties of Cyclo-Pentane, -Hexane and -Heptane and Derivatives. A. I. Vogel ... 4366
Path of Ray of Light Tangent to Surface of Earth. J. Sweer ... 4433
Optical Properties of Liquid Suspensions. L. Amy ... 4462
Gas Absorption and Optical Constants of Thin Metal Foils. M. Kindinger and K. Koller ... 4503
Optical Constants of Very Thin Metal Films. K. Försterling ... 4504
Abnormal Birefringence in a Compressed Transparent Substance. A. Cotton, G. Courtot and J. Guillemin ... 4505
Refractive Dispersion of Oils and Fats. Part I. V. T. Athavale and S. K. K. Jatkar ... 4506
Dispersion Theory. C. Schaefer ... 4507
Physical Chemical Properties of cis- and trans-Decahydronaphthalene. W. F. Seyer and R. D. Walker ... 4580
Dielectric Properties of Some Organic Substances. G. R. Paranjpe and D. J. Davar ... 4648
Birefringence of Quartz under Compression and its U.V. Dispersion. G. Bruhat and A. Blanc-Lapierre ... 4930
Refraction, Dispersion, and Related Properties of Pure Hydrocarbons, Arranged for Use in the Analysis of Hydrocarbon Mixtures. A. L. Ward and S. S. Kurtz, Jr. ... 4931
Anomalous Dispersion and Free Rotation. A. Budó ... 5037

5. Glasses, Optical Media and Materials.

Availability of Optical Glass in America. G. W. Morey ... 682
Optical Glass Requirements of the Optical Industry. W. B. Rayton ... 683
Optical Glass at the National Bureau of Standards. A. N. Finn ... 684
Infra-Red Spectrum and Structure of Silicates and Glasses. F. Matossi ... 736
Expansion of Glass with Tempering and Annealing. E. Rencker ... 1171
Tempering and Annealing of Boric Anhydride Glass. E. Rencker ... 1172

For the **Key** to this Index see pp. 1182 to 1194.

Reflection, Refraction and Dispersion (Radiation), *continued.*

Abstract Nos.

Boundary of Softening Range for Binary System $Na_2B_4O_7$ -B_2O_3. A. Leontjewa 1173
Optics and Glass Industry. E. D. Tillyer 1174
Strain in Glass. Part II. N. Winter-Klein 2261

7. Unclassified.

Production of Large Single Crystals of KBr for Optical Use. D. C. Stockbarger 431
Optical Illusions Produced by a Rotating Beacon. L. Dunoyer 685
Radii of Curvature. K. Giesebart 3941

Relativity and Ether.

1. Special (or Restricted) Theory of Relativity.
2. General Theory of Relativity.
3. Unitary Field Theory.
4. Unclassified.

Cross-References :
Cosmology, *see* Cosmogony.
Doppler Effect, *see* Transmission (Radiation).
Velocity of Light, *see* Transmission (Radiation).

1. Special (or Restricted) Theory of Relativity.

Restriction of a Theorem of Relativistic Dynamics. H. Hermann 1476
Red Shifts of the D Lines of Sodium in the Sun. J. Evershed 1537
General Equations of Restricted Relativistic Dynamics. G. Garcia 2280
Mass and Gravitation. J. Roubaud-Valette 3100
Electromagnetic Field in Special Relativity. J. Roubaud-Valette 3394
Measurement of Velocity of Light over a Single Journey. R. J. Clark 4153
Criticism of the Special Theory of Relativity. A. Eagle 4347
Concept of a Discrete Space-Structure. A. March 4800
Spinor Calculus. T. Sibata 4804
Equation of Motion of a Particle in Wave Geometry. T. Iwatsuki, Y. Mimura and T. Sibata 4805
Cosmology in Terms of Wave Geometry. Part I. Y. Mimura and T. Iwatsuki 4806
Cosmology in Terms of Wave Geometry. Part II. T. Sibata 4807
Cosmology in Terms of Wave Geometry. Part III. H. Takeno 4808
Cosmology in Terms of Wave Geometry. Part IV. K. Itimaru 4809
Finslerian Wave Geometry and Milne's World Structure. T. Hosokawa 4810

2. General Theory of Relativity.

Deflection of Light Rays in the Sun's Gravitational Field. A. v. Brunn and H. v. Klüber 69
Relativistic Framework for the Causality Principle. W. Scherrer 476
Plane Polarised Waves in the General Theory of Relativity. N. Rosen 477
New Mechanics of Material Systems. M. Mathisson 969
Spinning Electron and its Dynamics. M. Mathisson 970
Theory of Relativity. C. W. Oseen 981
Relativity and Quantum Theory. M. Born 1477
Non-Statistical Solutions of the Gravitational Equations of Relativity. B. Datt 1850
Principles of Physics. W. Scherrer 2289
Meaning of Uniform Time and the Kinematic Equivalence of the Extra-Galactic Nebulae. E. A. Milne and G. J. Whitrow 2321
Expansion of a Nebula. N. R. Sen 2323
New Equations of Motion of Material Systems in a Minkowski World. J. Lubański 2723
Problem of *n* Bodies in General Relativity Theory. A. S. Eddington and G. L. Clark 2724
Linear Equivalence. E. A. Milne and G. J. Whitrow 2752
Reduction of Einstein's Gravitational Equations to the Normal Form. A. Finzi 3540
Light Signals Sent around a Closed Path. H. E. Ives 3964
Eddington's World-Theory. E. Schroedinger 4348
Generalisation of Relativity Transformations. G. Wataghin 4349
New Systems of Normal Coordinates for Relativistic Optics. G. Temple 4350

Relativity and Ether, *continued.*

Abstract Nos.

Curvature of Space and the Limited Dimensions of the Stars. L. Laboccetta 4380
Eddington's Relation between Radius of Electron and Radius of Universe. L. Laboccetta 4381

3. Unitary Field Theory.

Unified Theory of Gravitation and Electromagnetism. J. Hély 478
Unitary Non-Holonomous Field Theory. Parts I and II. K. Yano 479
Different Forms of an Action Function Expressed by Means of Complex Variables. M. A. Tonnelat-Baudot 982
Born's Electrodynamics in Terms of Wave Geometry. T. Iwatsuki, Y. Mimura and K. Morinaga 1838
Wave Geometry Unifying Einstein's Law of Gravitation and Born's Theory of Electrodynamics. T. Sibata 1839
Invariant Form of the Maxwell-Lorentz Field Equations for Accelerated Systems. G. Kron 1851
Suggestion for Unifying Quantum Theory and Relativity. M. Born 1852
Equations of Electromagnetism. Part I. Identifications. Part II. Field Theory. E. A. Milne 2178
System of Gravitational Equations of the First Order. G. Wataghin 2290
Application of "Reciprocity" to Nuclei. M. Born 2649
Unified Field Theories. W. E. Kock 2725
Electromagnetic and Gravitational Radiation. L. Infeld 2726
Use of Potential in Born's Electrodynamics. Z. Chrapływy 3026
Biquaternions in Born's Electrodynamics. B. S. M. Rao 3101
Electrodynamics and Cosmology. H. Mandel 3580
Analogy between Photon and Electron and Derivation of Quantum Equation. H. T. Flint 4470
Field Theory of the Atom. H. Takeno 4797

4. Unclassified.

Metrical Field and Gravitational Field. J. Weyssenhoff 480
Doppler Effect Considered in Relation to the Michelson-Morley Experiment. H. E. Ives 481
Einstein Spaces in a Space of Constant Curvature. A. Fialkow 1478
Uncertainty Relations in the Measurement of Space-Time. R. W. Ditchburn and H. Motz 1834
Mathematical Theory of a New Relativity. Rotational Theory of Light and Matter. S. M. Sulaiman 2727
Experimental Study of the Rate of a Moving Atomic Clock. H. E. Ives and G. R. Stilwell 3541

Seismology.

1. Theory.
2. Observational.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-Reference:
Earth Tides, *see* Land, Physics of the.

1. Theory.

Correlation of Frequencies of Seismic Disturbances with the Hour Angle of the Moon. H. T. Stetson 571
Seismic Waves and Block Structure of the Earth's Crust. K. Takahasi 572
Method of Production of Earthquakes. E. Rothé and E. Peterschmitt 573
Southern Earthquakes and the Core Waves. H. Jeffreys 574
Constants of Galitzin Seismograph in Presence of Reaction. J. Rybner 575
Horizontal Pendulm Movements in Relation to Latitude Variation. F. N. Denison 1020
Prevalent Periods of Oscillations in Tidal Waves. K. Sezawa and K. Kanai 1077
Deep-Focus Earthquakes and Anomalies of Terrestrial Magnetism and Gravity. S. W. Visser 1096
Rayleigh Waves. K. Sezawa and K. Kanai 1097
Elastic Stability of the Earth. K. Sezawa and K. Kanai 1098
Plastic State of the Earth under Gravitational Forces. K. Sezawa 1099
Origins of Earthquakes. W. Inouye 1100
Unsolved and Partially Solved Seismological Problems. N. H. Heck 1557

Seismology, *continued.*

Abstract Nos.

Travel Times for Shear Waves in a Granite Layer. F. Birch ... 1558
"High Focus" Earthquakes of the International Seismological Summary. E. Tillotson ... 1938
Reflection of Plane Wave Pulses from Plane Parallel Plates. M. Muskat ... 2013
Dynamic Damper for Seismic Structural Vibration. K. Kanai ... 2375
Origin of Earthquakes. Part V. W. Inouye ... 2376
Aftershocks and Periodicity in Earthquakes. H. Jeffreys ... 2377
Rearrangement of Characteristic Frequencies and Damping in Coupled Oscillations. K. W. Wagner ... 2698
Plastic State of Planets. K. Sezawa and K. Kanai ... 2758
Strength of the Earth's Outer Shells. R. A. Daly ... 2789
Rayleigh Waves. K. Sezawa ... 2804
Earth's Outer Crust. P. Caloi ... 2805
Interconnection of Translational and Torsional Vibrations in Buildings. R. S. Ayre ... 2806
Ellipticity Corrections to Seismic Waves. K. E. Bullen ... 2807
New Theory of Earth's Core. J. Lynch ... 3167
Reality of the Seismic-Electric Effect. S. v. Thyssen, J. N. Hummel and O. Rülke ... 3180
Seismic Electric Effects and their Possible Employment in Seismometry. A. Belluigi ... 3181
Earthquake Problems of India. S. K. Banerji ... 3182
Anomalous Dispersion of Elastic Surface Waves. K. Sezawa ... 3627
Gravitational Stability of the Earth at its Liquid Cooling Stage. K. Sezawa and K. Kanai ... 4027
Effect of Cooling on a Plastic Earth under Gravitational Forces. K. Sezawa and K. Kanai ... 4028
Seismic Waves Due to Tractions Applied to the Inner Surface of a Spherical Cavity in an Elastic Earth. G. Nishimura and T. Takayama ... 4047
Anomalous Dispersion of Rayleigh Waves. K. Sezawa and K. Kanai ... 4048
Travel-Times of Seismic Waves P and S. A. W. Lee ... 4436
Focal Points of SKS. B. Gutenberg ... 4437
Rayleigh Waves. H. Bateman ... 4438
Effect of Cooling on a Plastic Earth under Gravitational Forces. Part II. K. Sezawa and K. Kanai ... 4854
Explanation of Different Wave Groups in Seismograms of Explosions. R. Köhler ... 4874
Damping of Period Visco-Elastic Waves with Increase in Focal Distance. K. Sezawa and K. Kanai ... 4875
Formation of Boundary Waves at the Surface of a Discontinuity within the Earth's Crust. Part I. K. Sezawa and K. Kanai ... 4876
Three Dimensional Vibrations of a Framed Structure. K. Kanai ... 4877
Origins of Earthquakes. W. Inouye ... 4878
Damping Coupling. G. Schmerwitz ... 5077

2. Observational.

Supposed Regional Variations in Travel Times. B. Gutenberg ... 1101
Royal Society Expedition to Montserrat, B.W.I. Final Report. C. F. Powell ... 1102
Vibrations of Bridges. D. S. Carder ... 1559
Atmospheric Pressure Variations as Secondary Cause of Earthquakes. V. Conrad ... 1939
Velocity of Elastic Waves in Sand. K. Iida ... 2354
P′ and the Earth's Core. B. Gutenberg and C. F. Richter ... 2378
Earthquakes and Seismic Methods in Submarine Geology. N. H. Heck ... 3183
Solar Cycle in Microseismic Disturbances. P. Bernard ... 3184
Thickness of the Isostatic Earth's Crust. C. Tsuboi ... 3505
Structure of the Earth as Revealed by Seismology. E. A. Hodgson ... 4026
Seasonal Distribution of Earthquakes. S. Yamaguti ... 4049
Earthquake Sounds. C. Davison ... 4439
Volcanoes, Geysers and Hot Springs. A. L. Day ... 4440

4. Unclassified.

Changes in Earth's Magnetic Field Accompanying Earthquakes or Volcanic Eruptions. Y. Katô ... 4443

For the **Key** to this Index see pp. 1182 to 1194.

Solution.

1. Theory.
2. Solubility.
3. Apparatus, *see* Supplementary Index.
4. Unclassified.

Cross-References :
General Properties of Solutions, *see* Appropriate Key-Headings.

Cross-References (*contd.*) *:*
Heats of Solution, *see* Thermochemistry.
Surface Phenomena, *see* Surface Properties.
Thermodynamical Effects, *see* Thermodynamics.

1. Theory.

Abstract Nos.

Experimental Tests of Salting-Out Theories. P. S. Albright 70
Correlation of Fluidity Curves with Freezing-Point Curves in Binary Systems. R. H. Ewell 249
Activity Coefficients of KCl and CaCl$_2$. E. A. Guggenheim and L. A. Wiseman 482
Validity of Henry's Law for the Calculation of Vapour Solubilities. J. H. Saylor, J. M. Stuckey and P. M. Gross 1691
Partial Molar Volumes of Strong Electrolytes at High Pressures. I. R. Kritschewsky 1853
Guggenheim's Theory of Strictly Regular Binary Liquid Mixtures. G. S. Rushbrooke 2291
Properties of Detergent Solutions. J. Powney and C. C. Addison 2305
Energy Relationships in Aqueous Solutions of Noble Gases. E. Lange and R. Watzel 2728
Theory of Two-Component Systems Involving Solution Forces. K. Fredenhagen 2729
Compressibility and Solvation of Solutions of Electrolytes. A. Passynski 2730
Change in Absorption of Water at $4{\cdot}7\ \mu$ Due to Solutions. E. K. Plyler and E. S. Barr 2840
Regular Gas Solutions. I. R. Kritschewsky 3102
Ions in Solution. H. S. Harned 3103
Mixtures of Ampholytes. A. Boutaric 3104
Distribution of RaD(Pb) between Crystals and Solutions of Ba(IO$_3$)$_2$. A. Polessitsky 3965
Gases and Metals. C. J. Smithells 3969
Optical Behaviour of Dissolved Ions and Structure of Electrolytic Solutions. Part VII. G. Kortüm 4140
Exchange Forces and Electrostatic Forces between Ions in Solution. R. W. Gurney 4216
Electrostatic Influence of Substituents on Dissociation Constants of Organic Acids. Parts I and II. J. G. Kirkwood and F. H. Westheimer 4217
Deformation of Molecules in Condensed Phases and the Hydrogen Bond. E. Bauer and M. Magat 4278

2. Solubility.

Solubility of D$_2$ and H$_2$ in Solid Pd. A. Sieverts and W. Danz 71
Incomplete Solubility of Liquid Iodine in Carbon Tetrachloride. J. H. Hildebrand 72
Solubilities of CuSO$_4$ and SrCl$_2$ in D$_2$O. F. T. Miles and A. W. C. Menzies.... 73
Transition Temperature of Gypsum to Anhydrite. A. E. Hill 74
Viscosity of Aqueous Solutions of Electrolytes. Part III. H. Tollert...... 94
Solubility of Citric and Tartaric Acids in Water. L. H. Dalman 483
Water Tolerances of Mixtures of Gasoline with Ethyl Alcohol. O. C. Bridgeman and E. W. Aldrich 484
Critical Solution Temperatures of Mixtures of Gasoline, *n*-Propyl Alochol, and Water. E. W. Aldrich 485
Gaseous Solubility and Surface Tension. H. H. Uhlig 983
Solubilities and Activity Coefficients of Lanthanum Iodate in Concentrated Salt Solutions at 25° C. J. N. Pearce and W. C. Oelke 984
Solubility and Activity Coefficient of AgIO$_3$ in KNO$_3$ Solutions. Standard Potential of Ag-AgIO$_3$ Electrode. I. M. Kolthoff and J. J. Lingane.... 985
Solubility and its Variation. H. G. Trieschmann 2292
Solubility of Ag in Hg. R. J. Maurer 2293
Solubility of Au in Hg. G. Mees 2294
Solutions of Electrolytes in Non-Aqueous Solvents. C. A. Kraus........ 3105
Solubility of Haloforms in Donor Solvents. G. F. Zellhoefer, M. J. Copley and C. S. Marvel 3106

For the **Key** to this Index see pp. 1182 to 1194.

Solution, *continued.*

Abstract Nos.
Aqueous Solubilities of Isomeric Hexanols. P. M. Ginnings and R. Webb 3107
OsO_4 in CCl_4 Solutions. L. H. Anderson and D. M. Yost 3966
Interaction between Solutes and Polar Solvents. W. J. Dunning and W. J. Shutt 4351
Atomic Resistance Increase of Dilute Lead Alloys between 273° and 14° K. A. Eucken and H. Schürenberg 4638
Elimination of Liquid-Junction Potential. Part I. B. B. Owen. Part II. B. B. Owen and S. R. Brinkley, Jr. 4664
Absorption of H_2 and N_2 by Pure Fe. K. Iwasè and M. Fukusima 4811
Solubility of H_2, D_2 and N_2 in Fe. A. Sieverts, G. Zapf and H. Moritz 4812
Solubility of Slightly Soluble Silver Salts. C. Bedel 4813
Distribution of Minute Amounts of Material between Liquid Phases. D. C. Grahame and G. T. Seaborg 4814
Equilibria in Two-Phase, Gas-Liquid Hydrocarbon Systems. Parts II and III. E. H. Boomer, C. A. Johnson and A. G. A. Piercey 5004

4. Unclassified.

Raman Effect and Constitution of ZnI_2 and CdI_2 Solutions. M. L. Delwaulle, F. François and J. Wiemann 1221
State of Solution of Soaps. Part I. Specific Volume of Dilute Sodium Oleate Solutions. M. Ulmann 2663
State of Solutions of Highly-Polymerised Substances. S. Papkov, S. Rogovin and V. Kargin 3108
X-Ray Investigation of the Form of Acetylsalicylic Acid in Certain Sugars. S. S. Sidhu 3757
Non-Aqueous Solutions. V. A. Plotnikov 4352

Spectroscopy.

1. Spectrum Analysis.
2. Atomic (Line) Spectra:
    (*a*) Wave-Length Standards.
    (*b*) Observation of Line Spectra in Emission.
    (*c*) Observation of Line Spectra in Absorption.
    (*d*) Analysis of Line Spectra.
    (*e*) Photometric Intensities and Contours of Lines.
    (*f*) Hyperfine Structure and Nuclear Moments.
    (*g*) Theoretical.
3. Molecular (Band) Spectra:
    (*a*) Observation and Analysis of Rotation (far infra-red) and Vibration (infra-red) Bands in Emission and Absorption.
    (*b*) Observation and Analysis of Electronic Bands and Band-Systems (near infra-red, visible and ultra-violet) in Emission and in Absorption.
    (*c*) Photometric Intensities of Bands and of Band-Lines and their Application to Nuclear Moments and Effective Temperatures.
    (*d*) Theoretical.
4. Continua:
    (*a*) In Emission.
    (*b*) In Absorption.
5. Line and Band Spectra in Fluorescence and Phosphorescence.
6. Zeeman Effect.
7. Stark Effect.
8. Raman Spectra.
9. Apparatus, *see* Supplementary Index.
10. Unclassified.
    Cross-References:
    Absorption, *see also* Absorption (Radiation).
    Critical Potentials, *see also* Conduction (Electric) and Discharge in Gases.
    Fluorescence and Phosphorescence, *see also* Fluorescence, etc.
    Solar Spectrum, *see* Sun.
    Stellar Spectra, *see* Stars.
    X-Ray Spectra, *see* X-Rays.

1. Spectrum Analysis.

Spectrographic Determination of Niobium and Tantalum. R. Breckpot and J. Creffier 1176
Spectrographic Investigation of Ternary Lead Base Alloys. R. Breckpot, J. Creffier and O. Perlinghi 1177
Effects of Polarity in the Electric Arc. R. Breckpot and C. Weyn 1178
Quantitative Spectrum Analysis of Highly Alloyed Iron. G. Limmer 1179
Quantitative Analysis, with Respect to the Component Structural Groups, of the Infra-Red (1 to 2 μ) Molal Absorptive Indices of 55 Hydrocarbons. F. W. Rose, Jr. 1180
Spectroscopic Methods of Chemical Analysis. W. R. S. Garton 1181
Spectrographic Research on Elements Existing as Traces in Sea Water. J. Bardet, A. Tchakirian and R. Lagrange 1540

Spectroscopy, *continued.*

Abstract Nos.
Determination of Cæsium by Emission-Spectra. A. Iwamura 2015
Determination of Lithium by Emission-Spectra. A. Iwamura 2016
Quantitative-Spectrographic Analysis of Biological Material. Part III. D. R. McRae, G. O. Langstroth and J. S. Foster 2017
Transport of Material in Sources for Spectroscopic Analysis. G. O. Langstroth and D. R. McRae 2447
Quantitative Spectrographic Analysis of Al-Mg Alloys. G. Balz 3239
Quantitative Analysis of Substances in Solution by U.V. Absorption Spectra. P. Gesteau 3240
Spectroscopy in Industry. G. R. Harrison 3703
Quantitative Analysis Based on Spectral Energy. M. Slavin 4114
Probable Existence of Element 93 in Natural State. H. Hulubei and Y. Cauchois 4115
Luminous Effect for the Detection of Sulphur Compounds. E. Schröer 4510

2. Atomic (Line) Spectra.

(*a*) *Wave-Length Standards*
Arc and Spark Spectra of Ytterbium. W. F. Meggers and B. F. Scribner .. 199
Infra-Red Spectra of Iron, Titanium and Carbon. C. C. Kiess 686
Hg I Spectrum. K. Murakawa 1183
Absolute Determination of Luminous Wave-Lengths as a Function of the Metric Unit. A. Pérard 1634
Calibration Wave-Lengths for Infra-Red Spectrometers. P. E. Shearin and E. K. Plyler 1635
Thorium Spectrum. M. Fred 1636
Spectrum of Calcium. N. E. Wagman 2448
Interferometric Wave-Length Comparison of the Red Cadmium Radiation Emitted by Different Sources. W. E. Williams and D. V. Gogate 4116
(*b*) *Observation of Line Spectra in Emission.*
Spectrum of Silicon. T. Takamine, T. Suga and M. Kamiyama 198
Arc and Spark Spectra of Ytterbium. W. F. Meggers and B. F. Scribner.... 199
New Method in Infra-Red Spectrography. M. Czerny and P. Mollet........ 687
Spark Spectra of Cæsium. R. Ricard, M. Givord and F. George.......... 688
Light Excitation by Hydrogen and Deuterium Canal Rays. R. Junkelmann .. 689
Optical Excitation of Gases by Canal Rays of Hydrogen and Deuterium. W. Hanle 819
Interference Measurements in the First Spectra of Neon, Argon and Krypton between 4812 and 3319 Å. C. J. Humphreys 1182
Seventh Spectrum of Chlorine (Cl VII). L. W. Phillips 1184
Spectroscopic Studies in the Extreme Ultra-Violet. T. Suga.......... 1637
Near Infra-Red Spectrum of Hg I. T. Suga, M. Kamiyama and T. Sugiura.. 1638
Excitation of Atomic Jets by Electronic Bombardment. R. Planiol 1704
Radial Inhomogeneity in Emission from an Indirectly Heated Hg Discharge Tube. E. Fischer and H. König 2417
High Terms of Paschen Series in Hydrogen and Deuterium. H. Nagaoka and T. Mishima 2449
Emission and Reversal in Excited Thallium Vapour. G. Kurz.......... 2450
Cs$^+$ Spectrum. R. Ricard 2451
Near Ultra-Violet Bands of Acetylene. Sho-Chow Woo, Ta-Kong Liu, T. C. Chu and Wu Chih 2452
Infra-Red Prism Spectroscopy. R. B. Barnes 2882
Spectra of I II, I I, and Cl II. K. Murakawa.......... 2883
Metallic Explosion Spectra. A. Michel-Levy and H. Muraour 3241
Spectrum of Neutral Iridium, IrI. W. Albertson 3704
Arc Spectrum of Silicon. C. C. Kiess 3705
Arc and Spark Spectra of Tungsten. D. D. Laun 3706
Influence of Tube Diameter on Concentration of Excited States in the Positive Column. W. Dirbach and K. Krebs 4195
Excitation of Balmer and Paschen Series of H and D by Electrodeless Discharge. H. Nagaoka and T. Mishima 4511
Fine Structures of Hα and Dα Under Varying Discharge Conditions. R. C. Williams 4933
Determination of e/m from the Hα -Dα Interval. R. C. Williams 5049

For the **Key** to this Index see pp. 1182 to 1194.

Spectroscopy, *continued.*

Abstract Nos.

(*c*) *Observation of Line Spectra in Absorption.*

Absorption Spectrum of Atomic Solutions of Tellurium in Sulphuric Acid. S. Boizowa and K. Butkow 690

Properties of the Water Vapour Spectrum and their Relations to Atmospheric Radiation. W. M. Elsasser 1185

Far Infra-Red Spectroscopy. H. M. Randall 2018

Infra-Red Absorption Spectra of Isomeric Aliphatic Hydrocarbons. P. Lambert and J. Lecomte 2453

Isotope Effect in Line Absorption Spectrum of Uranyl Nitrate. G. Joos and B. Duhm 4934

Infra-Red Absorption of Atmospheric Water Vapour. W. M. Elsasser 4935

(*d*) *Analysis of Line Spectra.*

Preliminary Analysis of the First Spark Spectrum of Cerium—Ce II. W. E. Albertson and G. R. Harrison 691

Spectrum of Doubly Ionised Mercury, Hg III. M. W. Johns 1186

Complex Atomic Spectra. E. W. Foster 1187

First Spark Spectrum of Manganese. C. W. Curtis 2019

Structure of the 3^3D Term of MgI. K. W. Meissner 2020

Spectrum of Tu IV. H. Gobrecht 2454

Screening Constants and Multiplet Transitions of the Rare Earths. H. Gobrecht 2455

Arc Spectrum of Indium, In I. F. Paschen 2456

Spectrum of Fe II. J. C. Dobbie 2884

Classification of Sn II Spectrum. W. W. McCormick and R. A. Sawyer 3242

New Terms in Spectrum of Na III. D. H. Tomboulian 4117

Spectra of Rb III and Sr IV. D. H. Tomboulian 4118

Near Infra-Red Spectrum of Cadmium. O. Masaki and K. Kobayakawa 4936

(*e*) *Photometric Intensities and Contours of Lines.*

Probability of Cumulative Excitation of Mercury Atoms. W. Fabrikant and J. Zirg 200

Displacement of Maximum of Mercury Resonance Line 2536·7Å. S. Rajski 201

Pressure Effects of Rare Gases on the Second Doublet of Rubidium Principal Series. Ny Tsi-Zé and Ch'en Shang-Yi 202

Pressure Effects of Homogeneous K Vapour in Absorption. D. S. Hughes and P. E. Lloyd 692

Luminiscent-Photographic Measurement of Ultra-Violet Energy Distribution L. N. Ananjeva and A. A. Shishlovsky 693

Probability of a Stepwise Excitation of Mercury Atoms. V. Fabrikant and I. Cirg 820

Excitation in Sources for Spectroscopic Analysis. G. O. Langstroth and D. R. McRae 1639

Relative Transition-Probabilities in Cd Spectrum. L. S. Ornstein, J. P. A. van Hengstum and H. Brinkman 1640

Broadening of the Hg Resonance Line 2536·7Å with increasing Density of Hg Vapour. G. P. Balin 2021

Cumulative Excitation of Atoms in a Low Pressure Mercury Discharge. W. Fabrikant, F. Butajewa and I. Zirg 2122

Measurements of Forbidden P-P Series of Li I in Carbon Arc. R. Siksna 2457

Width of Spectral Lines in High Pressure Hg Discharge. R. Rompe and P. Schulz 2458

Effect of Gases on Width and Position of Spectral Lines. P. Schulz 2885

Negative Dispersion in Electrically Excited He. M. Kruse 3238

Wave-Mechanical Treatment of Line Broadening. A. Jabłoński 3243

Intensity Relations in the L. V. Helium Arc. J. J. Heilemann 3244

Direct Intensity Registration in Spectrophotometry. M. Minnaert and J. Houtgast 3245

Hydrogen and Deuterium Balmer Series. V. Černiaev 3707

Effect of Magnetic Field upon Mercury Discharge Radiation. V. Fabrikant and G. Rokhlin 4075

Broadening and Displacement of Higher Series Lines of Sodium by Cs-Vapour. C. Füchtbauer and G. Heimann 4119

Effect of Current Strength on Line Broadening in High Pressure Hg Discharge. R. Rompe and P. Schulz 4512

Light Intensity Distribution in High-Pressure Hg Arc Discharge. F. Rössler 4513

Visible and U.V. Radiation of High-Pressure Hg Discharge. J. Kern 4514

Spectroscopy, *continued.*

Abstract Nos.

Improvements in Fused-Quartz Mercury Arcs. L. B. Johnson and S. B. Webster 4515
Pressure Broadening in the Wings of the Mercury Resonance Line 2537Å. H. A. Rühmkorf 4516
Electron Temperature and Light Excitation in Gas Discharge Excited by Short and Ultra-Short Waves. W. Nöller 4517
Energy Distribution in a Spectrum Consisting of Lines and Continuum. F. Rössler 4518
Long-Wave Infra-Red Spectrum of Quartz-Mercury Lamps. B. Koch 4937

(*f*) *Hyperfine Structure and Nuclear Moments.*

Nuclear Moment of Barium. A. N. Benson and R. A. Sawyer 224
Method for Study of Hyperfine Structure and Width of Absorption Rays. M. Duffieux and J. Bollot 721
Hyperfine Structure and Nuclear Moments of Aluminium. D. A. Jackson and H. Kuhn 722
Mechanical Moment of the Sr^{87} Nucleus and the Radioactivity of Rb^{87}. M. Heyden and H. Kopfermann 723
Isotope Displacement in Tungsten Lines. M. Kiuti, H. Hasunuma and T. Kawada 1188
First Spark Spectrum of Indium, **In** II. F. Paschen and J. S. Campbell 1189
Zeeman Effect of Hyperfine Structure Components. E. Rasmussen 1217
Spin Change in the Radioactive β-Decay of ^{87}Rb into ^{87}Sr. M. Heyden and H. Kopfermann 1580
Hyperfine Structure of the Forbidden Hg-Line 2655·8Å (6^3P_0-6^0S_0). S. Mrozowski 1641
Fine Structure of the First Spark Spectrum of Arsenic in the Visible Region. S. K. Mukerji 1642
Intensity Measurements in Hyperfine Structure of the Mercury Line 6^3P_2-7^3S_1, 5461 Å in Absorption. H. C. Burger and P. H. van Cittert 1643
Nuclear Moments of Indium. S. Millman, I. I. Rabi and J. R. Zacharias .. 1644
Isotope Displacement in the Spectrum of MgI. K. W. Meissner 2022
Hyperfine Structure of the Al Spark Line 2669·2 Å. R. Ritschl 2023
Hyperfine Structure, Zeeman Effect and Isotope Shift in the Resonance Lines of Potassium. D. A. Jackson and H. Kuhn 2024
Nuclear Magnetic Moments. D. R. Inglis 2025
Signs of Nuclear Magnetic Moments of Li^6 and K^{41} J. E. Gorham 2026
Magnetic Moments of ${}^{151}_{63}Eu$, ${}^{153}_{63}Eu$, ${}^{185}_{75}Re$, ${}^{187}_{75}Re$, ${}^{79}_{35}Br$, ${}^{81}_{35}Br$. T. Schmidt 2027
Intensity Measurements in Hyperfine Structure of the Mercury Line 6^3P_2-7^3S_1, 5461Å in Absorption. H. C. Burger and P. H. van Cittert 2459
Nuclear Moment of Al. M. Heyden and R. Ritschl 2886
Nuclear Magnetic Moment of Li^7 by Perturbation Theory. D. R. Inglis 3246
Effective Cross-Section for Collisions of the Second Kind in Excited Hg Vapour and Hyperfine Structure of Hg Resonance Line 2537Å. O. Buhl 3247
Quadrupole Moments of ${}^{83}_{36}Kr$ and ${}^{131}_{54}Xe$ and the Mechanical Moment of ${}^{83}_{36}Kr$. H. Korsching 3248
Hyperfine Structure of Zeeman Components of Resonance Lines of Sodium. D. A. Jackson and H. Kuhn 3708
Hyperfine Structure of the Forbidden Hg Line 2655·8 Å (6^3P_0-6^1S_0). W. Opęchowski 3709
Hyperfine Structure of B, Y, Rh and Pd. D. T. Williams and L. P. Granath 4120
Nuclear Magnetic Moment of Copper. S. Tolansky and G. O. Forester 4121
Effective Cross-Section for Collisions of the Second Kind in Excited Hg Vapour and Hyperfine Structure of Hg Resonance Line 2537 Å. O. Buhl 4519
Hyperfine Structure Interval Rule in Indium. D. H. Tomboulian and R. F. Bacher 4520
Nuclear Spin of Iodine. Part III. S. Tolansky and G. O. Forester 4521
Hyperfine Structure of Os Lines. T. Kawada 4938

(*g*) *Theoretical.*

Intensity Dissymmetry in the Emission of Light from Canal Rays. J. Stark and H. Verleger 203
Low Terms in Cr III, Cr IV, Mn IV and Fe V. I. S. Bowen 204
Energy Levels of Neon and Argon. J. B. Sampson 205
Light Absorption at the Series Limit of Line Spectra. R. W. Ditchburn 694
Emission Spectra of Nd^{+++} Ions in Phosphors and their Absorption Spectra in Crystals. P. C. Mukherji 695
Fine Structure of the Helium Line λ4686. W. Leo 696

Spectroscopy, *continued.*

Abstract Nos.
Spectrum of Argon, A^+. W. v. Meyeren 1645
Fine Structure of the Nuclear Ground Level of 7Li. G. Breit and J. R. Stehn 2028
Calculation of Electron Affinities with the Help of New Extrapolation Formulae for Optical Terms. M. Mamotenko and H. Hellmann 2029
Term Values in Carbon. C. W. Ufford 2030
Emission of Radiation in the Positive Column of a Mercury Arc. B. T. Barnes and E. Q. Adams 2116
Mechanism of Positive Column in Mercury Vapour at Intermediate Pressures. E. Q. Adams and B. T. Barnes 2117
$3d^84s$ Configuration of NiII. T. Yamanouchi 2460
Polarisation of Light Emitted from Canal Rays. H. Angenetter and H. Verleger 2461
New Soluble Case of the Equation of Transfer for a Line Frequency. M. Krook 2766
Excited States of the H^3 and He^4 Nuclei. S. S. Share 2887
Low Terms of Co VI. I. S. Bowen 2888
Energy Levels of the Electron Configuration p^2p'. M. Masiko 3249
g-Factor of Inert Gas Terms of Configurations Containing *d*-Electrons. K. Lörinczi 3250
Non-Coherent Formation of Absorption Lines. R. v. d. R. Woolley 3590
Atomic Energies for Configurations Containing Almost Closed Shells. T. Yamanouchi 4122
Lower Limit for Theoretical Energy of Normal State of Helium. A. F. Stevenson and M. F. Crawford 4123
Atomic Energy Levels of p^np and d^np Configurations. T. Yamanouchi 4522
Tables Facilitating Calculation of Line Absorption Coefficients. F. Hjerting.. 4843
Wave Functions and Potential Curves for Excited H_2. A. S. Coolidge and H. M. James 4939
Extension of Theory of Complex Spectra. G. H. Shortley and B. Fried 4940
Structure of Configurations of High Azimuthal Quantum Number in Cu II and Rare Gases. G. H. Shortley and B. Fried 4941
Intervals of X-Ray Spin-Doublets. G. Araki and S. Noma 4972

3 Molecular (Band) Spectra.

(*a*) *Observation and Analysis of Rotation* (*far infra-red*) *and Vibration* (*infra-red*) *Bands in Emission and Absorption.*

Absorption Spectrum of Water. A. Carrelli 206
Rotation-Vibration Band of Methyl Fluoride in the Photograhpic Infra-Red. S. M. Naudé and H. Verleger 207
Rotation Vibration of Molecules Containing Deuterium. Part III. Band of HDO at $1\cdot161\mu$. L. Herzberg 208
Infra-Red Absorption of Benzene, Chlorobenzene and Bromobenzene. M. Battista 700
Infra-Red Absorption of Chloroform and Bromoform. A. Maione.......... 701
Infra-Red Spectroscopic Examination of Intermolecular Bonds. J. Errera.. 702
Near Infra-Red Absorption Spectra of Amines in the Vapour and Liquid States. M. Freymann 703
Near Infra-Red Absorption Spectra of Solutions of Gaseous Hydrogen Chloride in Oxygenated Organic Solvents. R. Freymann and J. Guéron 704
CH Absorption Bands of Saturated and Ethylenic Hydrocarbons between 600 and 9500 Å. P. Barchewitz 705
Absorption Bands of Hydrogels between $2\cdot5$ and $3\cdot5\mu$. A. M. Buswell, K. Krebs and W. H. Rodebush 706
Determination of Binding Moment by Infra-Red Absorption Measurements. R. Mecke 707
Vibration Spectra and Electric Moments of Azomethane, N-N^1 Dimethylhydrazine and Acetaldazine. W. West and R. B. Killingsworth 708
Infra-Red Absorption of the OH Group of Phenol. W. Gordy and A. H. Nielsen 709
Infra-Red Absorption Spectrum of Phosgene. C. R. Bailey and J. B. Hale 710
Infra-Red Spectra and Modes of Vibration of Benzene Derivatives. Part I. Monosubstituted Derivatives. J. Lecomte.. 1190
Interpretation of the TiO Infra-Red Bands. P. P. Dobronravin 1191
Absorption of CO_2 in the Region of the Band $4\cdot3\mu$ between 300° and 1000° Abs. C. Tingwaldt 1192
Water Molecules in Active Solutions. G. Bosschieter, J. Errera and R. Gaspart 1193

Spectroscopy, *continued.*

Abstract Nos.

Infra-Red Spectrum of Water in an Inert Solvent. L. B. Borst, A. M. Buswell, and W. H. Rodebush 1194
$4{\cdot}3\mu$ Fundamental Band of CO_2 Spectrum. D. M. Cameron and H. H. Nielsen 1195
Infra-Red Spectra of Organic Molecules. L. Kellner 1196
Spectra of the Cæsium Molecule. W. Finkelnburg and O. T. Hahn 1646
Influence of Solvents on the Infra-Red Absorption of Solutions of Neodymium and Samarium Acetyl Acetonates. M. Radoitchitch 1647
Infra-Red Absorption Spectrum of Methylene Chloride. C. Corin and G. B. B. M. Sutherland 1648
Dissociation Energy of the CN Molecule. R. Schmid, L. Gerö and J. Zemplén 1649
Far Infra-Red Transmission of Benzene Derivatives. M. Parodi 1666
Far Infra-Red Spectroscopy. H. M. Randall 2018
Inner Rotation and Normal Vibrations of Ethane. Part I. E. Bartholomé and J. Karweil. Part II. W. Hunsmann 2031
Infra-Red Reflection Spectrum of Glasses. F. Matossi and H. Bluschke 2032
Application of the Infra-Red Absorption Spectra to the Determination of the Position of Ethylene-Linkages. P. Lambert and J. Lecomte 2462
Infra-Red and Raman Spectra of Cis-and Trans-Butene-2. H. Gershinowitz and E. B. Wilson, Jr. 2463
Far Infra-Red Absorption of Atmospheric Water Vapour. W. M. Elsasser 2889
Repetition of Vibration Spectrum of Organic Molecules near each Fundamental and Harmonic of the CH Group. Yeou Ta 3251
Infra-Red Absorption of Trisubstituted Benzene Derivatives. Symmetry of Benzene. J. Lecomte 3252
Infra-Red Absorption by $C^{13}O_2^{16}$ at $4{\cdot}375\mu$. A. H. Nielsen 3253
Absorption of the CH_2 Group in the Region of 3μ. J. J. Fox and A. E. Martin 3710
Infra-Red Absorption of Thionyl Chloride. S. Vencov and D. Stefănesçu 3711
Molecular Structures of CF_4 and SiF_4. C. R. Bailey, J. B. Hale and J. W. Thompson 3891
Absorption Spectra of Cis- and Trans-Isomers in the Near Infra-Red. Yeou Ta 4124
Infra-Red Absorption Spectrum of H_2O_2. C. R. Bailey and R. R. Gordon 4125
Inner Rotation and Normal Vibrations of Ethane. Part III. K. Schäfer. Part IV. J. Goubeau and J. Karweil. Part V. J. Karweil and K. Schäfer 4126
Vibrational Spectrum and Thermodynamic Properties of Nickel Carbonyl. B. L. Crawford, Jr., and P. C. Cross 4127
Vibration Spectra and Molecular Structure. Part IV. Infra-Red Absorption Spectra of Double and Single Molecules of Formic Acid. L. G. Bonner and R. Hofstadter 4128
Vibration Spectra and Molecular Structure. Part V. Infra-Red Studies on Light and Heavy Acetic Acids. R. C. Herman and R. Hofstadter 4129
Vibration Spectra and Molecular Structure. Part VI. Infra-Red Absorption Spectrum of Heavy Formic Acid. R. Hofstadter 4130
Infra-Red Absorption Spectra of Pyrrol, Thiophene and Furane. R. Manzoni-Ansidei and M. Rolla 4523
Infra-Red Absorption of Heterocyclic Compounds. J. Lecomte 4524
Infra-Red Absorption Spectrum of CH_3OH. A. Borden and E. F. Barker 4525
Infra-Red Absorption Spectra of CH_3OD and CH_2DOD. E. F. Barker and G. Bosschieter 4526
S-H Frequency of Mercaptans. D. Williams 4527
Infra-Red Spectrum and Structure of Glasses. F. Matossi 4942
Vibrational-Rotational Radiation Transitions in Water Molecules in Non-polar Solvents. J. W. Ellis and E. L. Kinsey 4943
Infra-Red and Raman Spectra of Ethane. B. L. Crawford, Jr., W. H. Avery and J. W. Linnett 4944
Infra-Red and Raman Spectra of Allene. J. W. Linnett and W. H. Avery 4945
Infra-Red and Raman Spectra of Cyclopropane and Ethylene Oxide. J. W. Linnett 4946

(*b*) *Observation and Analysis of Electronic Bands and Band-Systems* (*near infra-red, visible and ultra-violet*) *in Emission and in Absorption.*

Refractive Dispersion of Organic Compounds. Part IX. Optical Exaltation in Unsaturated Hydrocarbons with Conjugated Double Bonds. T. M. Lowry and C. B. Allsopp 197
Frequency of Oscillations of the OH Group in Methyl Alcohol and its Dependence on Density. G. S. Landsberg and S. A. Ukholin 209

For the **Key** to this Index see pp. 1182 to 1194.

Spectroscopy, *continued.*

Abstract Nos.

Dependence of the Combination Spectrum of Water on Density and Pressure. S. A. Ukholin 210
Light Absorption and Absolute Concentration of Hydroxyl. L. Avramenko and V. Kondratjew 211
Absorption Spectra and Structure of Compounds with Visible Colour. P. Ramart-Lucas 212
U.V. Absorption Spectra of the Isomers of Butene-2 and Pentene-2. E. P. Carr and H. Stücklen 213
Spectrum of SiF. T. Yuasa 214
Spectrum of SnF. F. A. Jenkins and G. D. Rochester 215
Extension of Spectrum of AgCl. F. A. Jenkins and G. D. Rochester 216
Band Spectrum of TiCl. K. R. More and A. H. Parker 217
Mass Ratio of the Carbon Isotopes from the Spectrum of CN. F. A Jenkins and D. E. Wooldridge 399
Study of Tertiary Amine Oxide Double Bond by Absorption Spectra and Rotatory Dispersion. H. S. French and C. M. Gens 672
Band Spectra of Halides of Hg, Cd and Zn. P. Trautteur 697
Emission Spectrum of SiBr$_4$. R. K. Asundi and S. M. Karim 698
Spectrum of the Arc in Hydrogen. R. W. Wood and G. H. Dieke 699
U.V. Absorption Spectra of Aqueous Solutions of Chromic Salts. H. Sueda 711
Absorption Spectrum and Photodecomposition of KMnO$_4$. A. L. S. Rao 712
Absorption Spectra of Azo-Compounds. A. Burawoy 713
Band Spectra of PbSe, and SnSe and PbTe in Absorption. J. W. Walker, J. W. Straley and A. W. Smith 714
Structure and Absorption Spectra of Colouring Matters. Isomeric Forms of Fluorescein. P. Ramart-Lucas 1197
Absorption Spectra of Chromium Complexes Containing D$_2$O and ND$_3$. B. Duhm 1198
Absorption of Copper Sulphate. B. Duhm 1199
Predissociation of Sulphur. E. Olsson 1200
Effect of Magnetic Field on the Absorption of Se$_2$. S. Rouppert 1201
Analogy of the Electron Terms of Oxygen-Like Molecules. E. Olsson 1202
Vibrational Analysis of U.V. Bands of Li$_2$, Na$_2$, and K$_2$. H. Yoshinaga 1203
Emission Spectrum of CCl$_4$. R. K. Asundi and S. M. Karim 1204
U.V. Absorption of CS$_2$. O. Amiot and H. Marsac 1205
Reversible Polymerisation as Origin of a New Type of Absorption Band of Dyestuffs. G. Scheibe 1206
New Bands Ending on the $1s\sigma\ 2p\sigma\,{}^1\Sigma_u$ State of H$_2$. O. W. Richardson 1207
Emission Band Spectrum of Chlorine (Cl$_2^+$). Part II. A. Elliott and W. H. B. Cameron. 1208
Spectrum of Lutecium Monoxide. W. W. Watson and W. F. Meggers 1209
Ultra-Violet Absorption in Simple Hydrocarbons. Part IV. Unsaturated Cyclic Hydrocarbons in the Schumann Region. E. P. Carr and H. Stücklen 1210
Ratio C^{12} : C^{13} of Isotopes in Diamond. R. Frerichs 1372
New Band in the Absorption Spectrum of the Earth's Atmosphere. A. Adel and C. O. Lampland 1554
Ultra-Violet Absorption Bands of Ethyl Alcohol, *n*-Propyl Alcohol, and *n*-Butyl Alcohol in Relation to Magneto-Optical Dispersion. W. J. G. Beynon .. 1590
Ultra-Violet Absorption Bands of Methyl Alcohol and Allyl Alcohol and their Relation to Magneto-Optical Dispersion. W. J. G. Beynon and E. J. Evans 1591
Electronic Transitions and Absorption Spectra of Pr^{+++} Ions. P. C. Mukherji 1650
Influence of Salts on the Absorption Spectra of Aqueous Cobalt Chloride Solutions. J. N. Pearce and L. R. Dawson 1651
Spectrum of Manganese Hydride, MnH. R. W. B. Pearse and A. G. Gaydon 1652
Use of Interference Spectrographs for the Study of Fine Structures in Molecular Spectra. S. Imanishi 2033
Infra-Red Absorption Spectra and Modes of Vibration of Disubstituted Benzene Derivatives. J. Lecomte 2034
Complexity of CH Bands of Benzene Derivatives. Structure of Benzene. B. Barchewitz 2035
Infra-Red Absorption Studies of Hydrogen Bonds between Unlike Molecules. W. Gordy 2036
Infra-Red Absorption Spectra of Hydrocarbon Vapours. D. Bârcă-Gălăteanu 2037

For the **Key** to this Index see pp. 1182 to 1194.

Spectroscopy, *continued.*

Abstract Nos.
Spectrum of HCN in the Photographic Infra-Red. E. Lindholm 2038
U.V. Absorption Spectra of the Systems MoO$_3$-NaOH in Dilute Solutions. Z. Soubarew-Chatelain and A. Berton 2039
U.V. Emission Spectra of the Slow Thermal Decomposition of Sodium Azide. R. Audubert 2040
Absorption Spectra of SO$_2$ and CS$_2$ in the Vacuum Ultra-Violet. W. C. Price and D. M. Simpson 2041
Hydrogen Molecular Spectrum. H. Hasunuma 2042
Band Spectrum of Thallium Hydride. Part I. B. Grundström and P. Valberg 2043
Rotational Analysis of Bands of Lead Sulphide. H. Bell and A. Harvey 2044
Absorption Spectra of Copper, Cobalt and Nickel Sulphates in Heavy Water. A. A. Zanko and A. E. Brodsky 2464
Base Strengths and Absorption Spectra of *p*-Methyl- and *p*-Bromo-Acetophenone. L. A. Flexser and L. P. Hammett 2465
Optical Investigations of the Adsorption of Porphyrins. F. Bandow 2466
Distribution of Rotational States in the Elementary Process of Molecule Formation and the Variation of the Relative Probability of Transition. H. Schüler and H. Gollnow 2467
Molecular Association Studied in the Infra-Red. J. Errera and H. Sack 2655
Franck-Condon Principle. A. Jabłoński 2890
Higher Harmonics in the Near Infra-Red of the Vibration of the C-H Linkage. A. Carrelli and P. Tulipano 2891
Infra-Red Absorption Spectra and Hydrogen Bridges. Part I. Near Infra-Red Spectra of Inorganic Oxyacids. T. Sidei and K. Imahori 2892
Spectrum of Thallium Chloride. H. G. Howell and N. Coulson. 2893
Band Spectra of SrCl and SrH. K. R. More and S. D. Cornell 2894
Infra-Red Absorption Bands in the Spectrum of Deutero-Formaldehyde. E. S. Ebers and H. H. Nielsen 2895
Absorption Spectrum of Caesium Hydride. G. M. Almy and M. Rassweiler 2896
Emission Bands of SiCl$_2$ and SnCl$_2$. R. K. Asundi, M. Karim and R. Samuel 2897
Predissociation of Sulphur. W. Lochte-Holtgreven 2898
Calcium Subfluoride. K. H. Hellwege 2944
Flame Spectra of Aliphatic Halides. Part II. W. M. Vaidya 3254
Structure and Absorption Spectra of Amino-Derivatives of Triphenylmethane. P. Ramart-Lucas 3255
Absorption Bands of Rb and Cs. Ny Tsi-Zé and Ch'en Shang-Yi 3256
Band Spectrum of Tin Oxide. Part II. P. C. Mahanti and A. K. Sen Gupta 3257
Rotation Analysis of the $a^3\Pi \rightarrow X^1\Sigma$ CO Band System. L. Gerö 3258
Rotation Analysis of the $C^3\Sigma + \rightarrow a^3\Pi$ CO Band System. L. Cerö 3259
Rotation Analysis of $a^{13}\Sigma \rightarrow a^3\Pi$ Bands of CO. L. Gerö. 3260
Absorption Spectrum of Fluorene in Various States of Aggregation. B. Twarowska 3261
Influence of Salts on Absorption Spectra of Aqueous Cobalt Chloride Solutions. R. Brdička 3262
Electronic Band Spectra of the Linear Molecules, HgCl$_2$, HgBr$_2$, HgI$_2$, and TeCl$_2$. M. Wehrli 3263
Emission Bands in the $3\ p^1\Pi cd$—$1s^1\Sigma$ System of the Hydrogen Molecule. C. R. Jeppesen 3264
Influence of Temperature on the Absorption Spectrum of Cadmium Vapour. T. Zamlyński 3712
Absorption of Gaseous CS$_2$ in the Schumann Region. E. Hauptman 3713
Absorption Spectra of the Pyrrol Dyestuffs. Part II. A. Stern and F. Pruckner 3714
Spectra of H$_2$O on Dioxane and Pyridine. G. S. Landsberg and V. S. Malyschev 3715
Absorption Spectra of Prascodymium and Neodymium in D$_2$O. S. M. Katchenkov 3716
Absorption Spectra of Chrome Alum Containing D$_2$O. H. Böhm 3717
Visible and U.V. Reflection Spectra of Solids. M. Billy and A. Berton 3718
Band Spectra of CaI$_2$, SrI$_2$ and BaI$_2$. P. Mesnage 3719
Absorption Spectra of Coordination Compounds. Part II. R. Tsuchida 3720
Absorption Spectra and Configuration of Complex Salts. Part II. H. Sueda 3721
Variation of U.V. Spectrum of Naphthalene with pH. M. Gex 3722
Infra-Red Absorption Spectrum of CD$_4$. A. H. Nielsen and H. H. Nielsen 3723
Spectra of NiCl, CoCl and FeCl. K. R. More 3724
Vacuum U.V. Absorption Spectra of Halogen Acids. W. C. Price 3725

Spectroscopy, *continued.*

Abstract Nos.

Kinetics of OH Radicals as Determined by Their Absorption Spectrum. Part III. Quantitative Test for Free OH; Probabilities of Transition. O. Oldenberg and F. F. Rieke 3726
CdF Spectrum. R. W. B. Pearse and A. G. Gaydon 3727
Infra-Red Study of Liquid Crystals. R. Taschek and D. Williams........ 3917
Analysis of Infra-Red Limit of Atmospheric Transmission. A. Adel and C. O. Lampland 4013
Rock-Salt Prismatic Solar Spectrum. A. Adel 4014
Origin of Infra-Red Telluric Absorption Band q_2. A. Adel 4015
Reflection Spectra of Solid Organic Substances. T. Guilmart 4131
Absorption Spectra of Coordination Compounds. Part III. R. Tsuchida and M. Kobayashi 4132
Absorption Spectra of Phthalocyanines and Associated Compounds. J. S. Anderson, E. F. Bradbrook, A. H. Cook and R. P. Linstead........ 4133
Absorption Spectrum of Biacetyl between 1500 and 2000 Å. V. R. Ells........ 4134
Spectra of HgH and HgD. Y. Fujioka and Y. Tanaka 4135
Band Spectrum of MgD$^+$. H. Juraszyńska and M. Szulc 4136
Band Spectra of Nitrogen Forming a Rydberg Series. T. Takamine, T. Suga and Y. Tanaka 4137
U.V. Band Spectra of HgCl, CdCl and ZnCl. S. D. Cornell 4138
Band Spectrum of PbF. Part II. G. D. Rochester. 4139
Optical Behaviour of Dissolved Ions and Structure of Electrolytic Solutions. Part VII. G. Kortüm 4140
Nature of Excited Centres in Alkali Halide Crystals. H. Wolff 4310
Absorption Spectra of Cyclopropane, Ethylene Oxide, Ethylene Sulphide, and Ethylene Imine in the Photographic Infra-Red E. H. Eyster 4528
Spectrum of Allene in the Photographic Infra-Red. E. H. Eyster 4529
Infra-Red Absorption and Association in Carboxylic Acids. A. M. Buswell, W. H. Rodebush and M. F. Roy........ 4530
Absorption Spectra and Molecular Structure. Parts II and III. S. Kato and F. Someno 4531
Absorption Spectra of Azo-Compounds and Halochromism. T. Uémura and Y Inamura 4532
Absorption Spectra of Salicylaldehyde-ethylenediimine and Related Compounds. R. Tsuchida and T. Tsumaki 4533
Absorption Spectra of Metal Complexes of 2,2^1-Dipyridyl. Part II. K. Yamasaki 4534
Absorption Spectra of $\alpha\beta$-Unsaturated Cyclic Carbonyl Compounds and their Dihydroderivatives. R. G. Cooke and A. K. Macbeth 4535
Absorption Spectra of 4-(p-Dimethylaminostyryl)-pyridine Methiodide and 2 : 4-Di-(p-Dimethylaminostyryl)-pyridine Methiodide. G. R. Clemo and G. A. Swan 4536
Absorption Spectrum of the Permanganate Ion in Crystal Lattices. J. Teltow 4537
Constitution and Absorption Spectrum of HNO$_3$. R. Dalmon 4538
Absorption Spectrum of Praseodymiun Salts. A. Seidel and J. Larionov 4539
Bands of H$_2$ Ending on the 2p$^1\Pi$ Level. G. H. Dieke. 4540
U.V.Band Spectra of Se, Te and their Oxides. Choong Shin-Piaw 4541
Vibrational Analysis for a New CuCl Band System Excited by Active Nitrogen. S. Bloomenthal 4542
Near U.V. Band System of SnO. W. Jevons 4543
Molecular Spectra of Halides of the Iron Group Especially FeCl. E. Miescher 4947
Influence of Temperature on Absorption Spectra of Solid Solutions of Samarium. O. Blank 4948
U.V. Absorption Spectra by Reflection. T. Guilmart and R. Freymann........ 4949
Visible and U.V. Absorption of Mineral Oxides and of their Hydroxides and Hydrates. A. Berton 4950
Absorption Spectra of Methyl Methacrylate and its Polymer. J. W. Goodeve 4951
Partial Analysis of Infra-Red Absorption Spectra of Organic Molecules in Dilute Solution. O. R. Wulf and L. S. Deming 4952
Negative Bands of N^{14}–N^{15}. R. W. Wood and G. H. Dieke 4953
Pressure Effect in the 2590 Å Band of MgH. A. Guntsch 4954
Predissociation of Sulphur. M. Désirant and B. Rosen........ 4955
Infra-Red Study of Acid Amide and Oxime Association. A. M. Buswell, W. H. Rodebush and M. F. Roy 4956
Infra-Red Study of Complex Formation Due to Hydrogen Bonding. A. M. Buswell, W. H. Rodebush and M. F. Roy........ 4957

Spectroscopy, *continued.*

Abstract Nos.

(*c*) *Photometric Intensities of Bands and of Band-Lines and their Application to Nuclear Moments and Effective Temperatures.*

Temperature Determinations from Band Spectral Data. H. P. Knauss and M. S. McCay 218
Rôle of Argon in the Production of Swan Bands. N. R. Tawde and D. D. Desai 715
Optical Determination of Composition of Mixtures of Vapours and Air. W. Kinder 1607
Excitation in Sources for Spectroscopic Analysis. G. O. Langstroth and D. R. McRae 1639
Rotational Energy Distribution of OH Molecules from the λ3064 Band. E. R. Lyman 1653
Auroral Region Temperature. L. Vegard and E. Tønsberg 2372
Abnormal Rotation of OH Molecules. H. Wakesima 3265
Gas Temperature and Population of Atomic Levels in a Carbon Arc at Low Pressure. R. C. Mason 3800
Temperature Dependence of Transition Probabilities in Absorption Spectra of Rare Earths. H. Ewald 4544
Temperature Measurement by the Method of Reversed Lines. H. J. Hübner 4583

(*d*) *Theoretical.*

Mechanical Analyser for the Solution of Secular Equations and the Calculation of Molecular Vibration Frequencies. D. P. MacDougall and E. B. Wilson, Jr. 58
Relation between Frequency and Reduced Mass of Diatomic Molecules. A. Carrelli and P. Trautteur 219
Two-Quantum States of H_2^+. M. V. Belikov and B. N. Finkelstein 220
Stability of Polyatomic Molecules in Degenerate Electronic States. Part II. Spin Degeneracy. H. A. Jahn 221
Exchange Phenomena and Isomeric Nuclei. T. Kahan 391
Possible Interpretation of the Bands of Ozone. L. Herman and Herman-Montagne 716
Interpretation of the Electron Spectra of Polyatomic Molecules. Part I. Franck-Condon Principle. F. Duschinsky 717
Molecular Vibrations in Deuterium Compounds. E. Bartholomé 718
Anomalous Vibrational Spectra. M. Blackman 719
Potential Energy Curve of the Excited State of LiH. E. J. Rosenbaum .. 720
Interatomic Distances in Simple Polyatomic Molecules. G. B. B. M. Sutherland 907
Rotational Energy-Levels of a Diatomic Molecule in a Tetrahedral Field. H. M. Cundy 976
Universal Constant of Band Spectra. Attribution of Band Lines to other Causes than the Rotation of the Molecule. H. Deslandres 1211
Assignment of Vibrational Frequencies to Particular Bonds with Reference to Methylacetylene and Ethane. F. T. Wall 1212
Vibration-Rotation Energy of Polyatomic Molecules. M. Eliashevich 1654
Conduction in Polar Crystals. Part I. N. F. Mott and M. J. Littleton. Part II. N. F. Mott. Part III. R. W. Gurney and N. F. Mott 1708
Predissociation of Isotopic Molecules. E. Olsson 2045
Spectra of the Monoxides of Cerium and Praseodymium. W. W. Watson .. 2046
Quadrupole Rotation-Vibration Spectrum of H_2. H. M. James and A. S. Coolidge 2337
Dispersion and Optical Anisotropy of Molecular Oxygen in Relation to its Absorption Spectrum. P. Pattabhiramayya 2446
Potential Function of $C_2H_xD_y(x + y = 4)$. Yong-Li Tchang 2468
Universal Constant of Band Spectra. H. Deslandres 2469
Line Width in HCN Bands. E. Lindholm 2899
Attribution of Band-Lines to Causes other than Rotation. H. Deslandres 2900
Spectroscopy and Valency. Part VI. R. W. Berriman and C. H. D. Clark .. 2901
Spectrum of a Diatomic Molecule and the Calculation of the Dissociation Energy. S. K. Chakravorti 2902
Triplet-Triplet Perturbations in Band Spectra. I. Kovács 3266
Singlet-Triplet Perturbations in Band Spectra. A. Budó and I. Kovács 3267
Absorption Spectra of Coordination Compounds. Part I. R. Tsuchida 3268
Predissociation in the Carbon Monoxide Spectrum at 8·83 Volts. R. Schmid and L. Gerö 3269
Vibrations of Certain Fluorides. M. Parodi 3270

For the **Key** to this Index see pp. 1182 to 1194.

Spectroscopy, *continued.*

Abstract Nos.

Presence of Infra-Red Absorption Band (OH), in the Intramolecular Hydrogen Bond. R. Freymann 3728
Attribution of Band-Lines to Causes Other than Rotation. H. Deslandres 3729
Mean Absorption and Equivalent Absorption Coefficient of a Band Spectrum. W. M. Elsasser 3730
Deformation of Molecules and Their Vibration Spectra in Condensed Phases. E. Bauer and M. Magat 4141
Test of Wave Mechanics in Molecular Spectra and Recent Developments in the Spectrum of H_2. O. W. Richardson 4545
Graphical Representation of Energy States of a Diatomic Molecule. R. Schmid and L. Gerö 4546
Calculations of Lower Excited Levels of Benzene. M. Goeppert-Mayer and A. L. Sklar 4547
Absorption Spectra of Aromatic Hydrocarbons. T. Förster 4958
Band Envelopes of Unsymmetrical Rotator Molecules. Part I. Calculation of Theoretical Envelopes. R. M. Badger and L. R. Zumwalt 4959
Calculation of Frequencies of Symmetrical Modes of Vibration for Molecules with Various Types of Symmetry. H. J. Bernstein 4960
Molecular Potential Curves from Spectroscopic Data. A. S. Coolidge, H. M. James and E. L. Vernon 4961
Systematics of Band-Spectral Constants. Part IV. C. H. D. Clark and J. L. Stoves. 4962
Nuclear Spin and Symmetry Effects in the Heat Capacity of Ethane Gas. E. B. Wilson, Jr. 4976

4. Continua.

(*a*) *In Emission.*
Continuous Absorption Spectrum of Methyl Bromide and its Quantal Interpretation. P. Fink and C. F. Goodeve 222
Point Source of Continuous Ultra-Violet Spectrum. F. Almasy 644
Intensity of the Continuous Spectrum of Hydrogen. N. D. Smith 1213
Intensity Distribution in the White Light of Electrically Excited Xenon. F. Gans 2416
Radial Inhomogeneity in Emission from an Indirectly Heated Hg Discharge Tube. E. Fischer and H. König 2417
Comparison of Intensities of Spectral Lines with a Total Radiation Source. T. N. Panay 2903
Transformation of a Band Spectrum into a Continuous Spectrum under the Influence of Pressure. J. Rouvillois and H. Muraour 3271
Production of Continuous Spectra by Electrical Excitation of Rare Gases. White Light. M. Laporte 3731
Energy Exchanges at Boundary Surfaces. H. J. de Boer 3760
Boric Acid Continuum Emitted by the Aureole of the Carbon Arc Light. W. Finkelnburg and H. Hess 4548
(*b*) *In Absorption.*
U.V. Absorption by Organic Substances. L. Marchlewski, W. Bednarczyk and R. Grinbaum 223
Light Absorption at the Series Limit of Line Spectra. R. W. Ditchburn 694
Continuous Absorption Spectra of Alkyl Iodides and Alkyl Bromides and their Quantal Interpretation. D. Porret and C. F. Goodeve 1655
Continuous U.V. Absorption Spectrum of Iodine Monochloride. J. L. Binder 3732

5. Line and Band Spectra in Fluorescence and Phosphorescence.

Fluorescence Spectra of p-p-Dioxy-dicinnamyl-Methane Solutions. K. Morkowska 1214
Emission Spectra of ZnS and Alkaline-Earth Sulphide Phosphors. S. Rothschild 1215
Fluorescence of the Rare Earths. H. Gobrecht 1216
Resolution of Luminescent Spectra Excited by U.V. Light. J. Ewles 2047
Fluorescence Spectrum of Autunite. S. Iimori and E. Iwase 2048
Fluorescence and Absorption Spectra of Pr^{+++} and Eu^{+++}. Part I. Energy States of Pr^{+++}. H. Lange 2470
Optical and Photochemical Study of the Vapours of Cuprous Halides. J. Terrien 2471

Spectroscopy, *continued.*

Abstract Nos.

Mechanism of Formation of HgH and HgD. Optical Excitation of CdD. L. O. Olsen 2870
Kathodoluminescence Spectrum Due to the Presence of Samarium in Solid Calcium Compounds. E. Iwase.. 2904
Polarisation of the Resonance Radiation of Sodium Vapour. P. Pringsheim.. 3272
Resolution and Interpretation of Luminescent Spectra of Solids at Low Temperatures. J. Ewles 3273
Fluorescence and Absorption Spectra of Pr^{+++} and Eu^{+++}. Part II. H. Lange 4142
Diffusion Fluorescense Spectra of the Ions of the Rare Earths in Solution and in Crystals. P. C. Mukherji 4143
Fluorescence, Absorption Spectra and Conductivity of Aqueous Solutions of Fluorescein, Rhodamine and Acriflavin. I. C. Ghosh and S. B. Sengupta 4549

6. Zeeman Effect.

Influence of the Magnetic Field on the Fluorescence of Mercury Vapour and Zeeman Effect in Band Spectra of Loosely-Bound Molecules. S. Mrozowski 724
Theory of Multipole Radiation. J. Blaton 1134
Zeeman Effect of Hyperfine Structure Components. F. Rasmussen 1217
Zeeman Effect in Intense Magnetic Field. P. Jacquinot 1656
Hyperfine Structure, Zeeman Effect and Isotope Shift in the Resonance Lines of Potassium. D. A. Jackson and H. Kuhn.... 2024
Zeeman and Paschen-Back Effects in Strong Magnetic Fields. P. Kapitza, P. G. Strelkov and E. Laurman.... 3274
Zeeman Effect of an Abnormal Series of Argon. P. Jacquinot 3733
Accuracy of Linear Law in Simple Cases of Zeeman Effect. P. Jacquinot 3734
Fluorescent Ion of Chromium in Ruby. B. V. Thosar 4090, 4914
Zeeman Effect in Spectrum of Neon. J. B. Green and J. A. Peoples, Jr 4963

7. Stark Effect.

Stark Effect of Singlet Lines of the Alkaline Earths. B. Svensson 225
New Dissymmetry in the Effect of an Electrical Field on the Hα Line. J. Stark and R. Ritschl 226
Stark Effect in Argon and Krypton. J. S. Foster and C. A. Horton 1218
Frequency and Polarisation of Stark Effect Components. R. Gebauer 2905
Intensity Relations of Stark Components in Hydrogen. N. Ryde 2906
Stark Effect in Multiplet Lines. W. Lochte-Holtgreven 3275
Axiality of Emission of Light from the Hydrogen Atom in an Electric Field. J. Stark, R. Ritschl and H. Verleger 3735
Light Emission and Ionisation of States of Motion of the Hydrogen Atom in Strong Electric Fields. J. Stark and R. Ritschl 3736
Hydrogen Lines near the Balmer Limit. A. Pannekoek 4850

8. Raman Spectra.

Raman Spectrum of Hydrocarbons with Condensed Nuclei. Part II. Dihydro-Anthracene, Acenaphthene, Fluorene. R. Manzoni-Ansidei.... 227
Classification of the Raman Lines of Crystalline Quartz. J. Cabannes and C. Bouhet 228
Raman Spectra of CH_3OH, CH_3OD, and CH_2DOD. J. O. Halford, L. C. Anderson and G. H. Kissin.... 229
δ(CH) Vibration in Sodium Formate. J. Gupta 725
Intensities of Raman Lines Due to Lattice Oscillations. S. C. Sirkar 726
Polarisation of Raman Lines of Pyrrol, Furane and Thiophene. A. W. Reitz 727
Raman Spectra of Diacylamines. B. V. Thosar 728
Raman Spectra of Benzene and Isotope Effect. H. C. Cheng, C. F. Hsueh and Ta-You Wu.... 729
Additional Raman Frequencies for Water. I. R. Rao and P. Koteswaram .. 730
Raman Spectra of Cyclo-Pentane, -Pentanone, -Pentene and -Pentadiene. A. W. Reitz 1219
Raman Spectra of PCl_3 and $BiCl_3$ in Various Solvents. A. E. Brodsky and L. W. Kortschagin. 1220
Raman Effect and Constitution of ZnI_2 and CdI_2 Solutions. M. L. Delwaulle, F. François and J. Wiemann 1221

For the **Key** to this Index see pp. 1182 to 1194.

Spectroscopy, *continued.*

Abstract Nos.

Raman Spectra of Hydrochlorides of Various Compounds. H. J. Bernstein and W. H. Martin 1657
Raman Spectra of Oximes. H. J. Bernstein and W. H. Martin 1658
Hydroxyl Frequency in the Raman Spectra of Acids and Acid Salts. C. S. Venkateswaran 1659
Raman Spectra of Mixed Crystals. S. C. Sirkar and I. Bishui 1660
Raman Effect in Gases Under Normal Pressure. J. Cabannes and A. Rousset 1661
Simple Method for Determining the Polarisation of Raman Lines. J. T. Edsall and E. B. Wilson, Jr. 1662
Isotope Effect in Vibration Spectrum of CCl_4. C. K. Wu and G. B. B. M. Sutherland 1663
Quantum Mechanical Resonance and Internal Rotation. S. Mizushima and M. Kubo 2049
Motion of Ethylene Halide Molecules in Crystals as Revealed by the Raman Effect. S. Mizushima and Y. Morino 2050
Normal Vibrations of Ethylene Halides. Y. Morino 2051
Infra-Red and Raman Spectra of Cis- and Trans-Butene-2. H. Gershinowitz and E. B. Wilson, Jr. 2463
Effect of Temperature on the Raman Spectrum of Liquid CCl_4. R. Ananthakrishnan 2472
Effect of Oblique Refraction at the Prism Surfaces on the Relative Intensities of Raman Lines. A. V. Rao 2473
Raman Effect in Sodium Nitrate. P. Pattabhiramayya 2474
Raman Spectrum and Constitution of Pentaerythritol. P. G. N. Nayar 2475
Raman Spectra of Crystalline Powders. E. Canals and P. Peyrot 2476
Automatic Photography of the Raman Spectra of Liquid Mixtures and Application of the Method to the Quantitative Determination of the Constituents. A. Andant 2477
Molecular Heat of Organic Vapours. K. Bennewitz and W. Rossner 2494
Specific Heats of Liquids in Relation to Raman Effect Data. S. Bhagavantam 2495
Constitution of Heavy Water. I. R. Rao and P. Koteswaram 2654
Raman Spectra of Water-Ethyl Alcohol Mixtures. F. Cennamo 2907
Raman Effect in Boric Acid and Boron Compounds. S. M. Mitra 2908
Origin of New Raman Lines Due to Molecules in the Solid State and of the "Wing" Due to Liquids. S. C. Sirkar and J. Gupta 2909
Fine Structure of Raman Lines in Benzene and Benzene-d_6. A. Langseth and R. C. Lord, Jr. 2910
Raman Spectra of Deutero-Ethylenes. M. de Hemptinne, J. Jungers and J. M. Delfosse 2911
Raman Effect in Solid Cyclohexane. S. M. Mitra 2912
Raman Effect of Methyl Derivatives. J. Wagner. 2913
Quantitative Investigations of the Polarisation of Raman Lines of Crystals. H. Michalke 2914
Raman Spectrum of Indanone. D. Biquard 3276
Raman Spectrum of Benzene Under High Dispersion and the Isotope Effect. B. S. R. Rao 3277
Raman Spectra of Compounds Containing the N-S Link. W. R. Angus, A. H. Leckie and T. I. Williams 3278
Heat Capacities of Crystals at Low Temperatures. S. C. Sirkar and J. Gupta 3293
Raman Spectrum Identification of a Mercuric Chlorobromide. M. L. Delwaulle 3737
Raman Spectrum of BF_3. D. M. Yost, D. DeVault, T. F. Anderson and E. N. Lassettre 3738
Raman Spectra of H_2S and D_2S (Gas, Liquid and Solid). G. M. Murphy and J. E. Vance 3739
Raman Effect Apparatus. A. H. Pfund 3741
Molecular Association of Acetic Acid. P. Koteswaram 3894
Raman Spectra of Crystalline Hydrates. E. Canals and P. Peyrot 4144
Raman Spectra of Ammonia and the Ammonium Ion. G. Costeanu 4145
Use of Raman Effect in Analysing Isomeric Dihalogenated Benzenes. R. Pajeau 4146
Raman Spectrum and Fluorescence of Dioxane. H. W. Hunter 4147
Raman Spectra and Structure of Associated Molecules of Organic Acids. V. Čelinzev 4148
Raman Spectra of Organic Silicates. B. V. Thosar and R. N. Bapat 4149
Vibrations and Structure of Ions of the Type XO_3. T. G. Kujumzelis 4150

For the **Key** to this Index see pp. 1182 to 1194.

Spectroscopy, *continued.*

Abstract Nos.

Hexacoordination in Telluric Acid, and in Molybdates and Tungstates in Solution. J. Gupta 4275
Deformation of Molecules in Condensed Phases and the Hydrogen Bond. E. Bauer and M. Magat 4278
Infra-Red Absorption and Raman Spectrum of HCl. B. Vodar, R. Freymann and Y. Ta 4550
Raman Spectra of Organic Bi-Cyclic Compounds. B. D. Saksena 4551
Normal Modes and Frequencies of the Sulphur Molecule. S. Bhagavantam and T. Venkatarayudu 4552
Raman Spectrum and Specific Heat of Sulphur. S. Bhagavantam and R. Venkatarayudu 4553
Normal Frequencies of Phosphorous (P_4). S. Bhagavantam and T. Venkatarayudu 4554
Raman Spectrum of Diphenyl. S. K. Mukerji and S. A. Aziz 4555
Raman Effect of Ethyl Derivatives. J. Wagner 4556
Raman Spectra of ClO', ClO'_2 and BO'''_3 Ions. T. G. Kujumzelis 4557
Raman Spectrum of Liquid Diborane. T. F. Anderson and A. B. Burg 4558
Variation of Raman Spectrum of Nitrate Solutions with Kation. E. R. Laird and F. M. Plesset 4559
Apparatus for Raman Spectroscopy at Low Temperatures. G. Glockler and M. M. Renfrew 4560
Infra-Red and Raman Spectra of Ethane. B. L. Crawford, Jr., W. H. Avery and J. W. Linnett 4944
Infra-Red and Raman Spectra of Allene. J. W. Linnett and W. H. Avery 4945
Infra-Red and Raman Spectra of Cyclopropane and Ethylene Oxide. J. W. Linnett 4946
Raman Spectra of Molybdic Acid and Molybdates in Aqueous Solution. M. Théodoresco 4964

10. Unclassified.

Study of Absorption Spectra by Means of Hartley Figures. C. Dufraisse and J. Houpillart 231
Anomalous Dispersion in the First Doublet of Cu and Au. L. Allegretti 680
Simplifications and Improvements in Spectrophotometry with Auxiliary Light Source. G. Bolla 734
New Method of Obtaining the Spectra of Metals. H. Muraour and A. Michel-Lévy 735
Infra-Red Spectrum and Structure of Silicates and Glasses. F. Matossi 736
Thermodynamic Functions of the Chloro -and Bromo-methanes, Formaldehyde and Phosgene. D. P. Stevenson and J. Y. Beach 784
Vacuum Spectroscopy. R. W. B. Pearse 1223
Excitation of Gases. Part II. W. Hanle 1703
Free Energy of Acetylene. A. R. Gordon 2088
Excitation of Light in Atomic Collisions between He or H and Alkaline Earths. K. Gailer 2481
Emission of Light by Low Velocity Particles. A. Kotecki 2482
Progress in Infra-Red Technique. M. Czerny and H. Röder 4561
Recent Work in Infra-Red. F. Matossi 4562
Physics in Pharmacy. R. L. McFarlan 4563

Stars.

1. Parallax, Magnitudes, Diameter, Mass, Density.
2. Motions.
3. Spectra.
4. Temperature.
5. Constitution and Evolution.
6. Galactic System.
7. Star Clusters and Clouds.
8. Variable Stars, Binaries and Novæ.
9. Catalogues and Stellar Photography.
10. Unclassified.

1. Parallax, Magnitudes, Diameter, Mass, Density.

Stellar Luminosity and Boundary-Layer Opacity. E. A. Milne 519
New Method in Stellar Statistics. A. Brill 520
Stellar Parallaxes Determined at the Royal Observatory, Greenwich 521
Stellar Parallaxes Determined Photographically at the Royal Observatory, Cape of Good Hope (Ninth List) 522

Stars, *continued.*

	Abstract Nos.
Central Grating for Trigonometrical Parallax of Bright Stars. E. Johansson	1004
Stellar Magnitudes. F. H. Seares	1030
Spectroscopic Absolute Magnitudes of 370 Southern Stars. D. Hoffleit	1031
Photovisual Magnitudes for the Selected Areas at $\delta = {}^{+}75°$. B. J. Bok and W. F. Swann	1032
Photoelectric Magnitude Sequence in the Pleiades. W. A. Calder	1033
Masses in Single-Spectrum Binary Systems. H. C. Plummer	1055
Red Magnitudes in Standard Regions at + 15°. C. Payne-Gaposchkin	1895
Standards for Selected Areas 140–206. S. Gaposchkin	1896
Magnitudes of 30 Brightest Stars in the North Polar Sequence. J. Stebbins and A. E. Whitford	1897
Photoelectric Magnitudes and the International Standards. F. H. Seares	1898
Comparison of Leiden and Mount Wilson Magnitudes for Polar Stars. F. H. Seares	1899
Investigation of Standards of Magnitude with a Wedge Photometer. A. H. Farnsworth	1900
Isophot and Effective Wave-Lengths in the Photometry of Integral Brightnesses, Isoplene and Effective Absolute Brightness in Stellar Statistics. A. Brill	1901
Mass-Luminosity Law and Parallaxes of Eclipsing Binaries. G. Durand	1902
Redetermination of Photographic Magnitudes in the Harvard Standard Regions at + 15°. J. L. Greenstein	2328
Errors in Photoelectric Stellar Photometry. E. J. Meyer	2329
Accuracy of Parallaxes Determined from Spectral Glass and Proper Motion. W. J. Luyten	2330
Stellar Parallaxes with the 60-in. and 100-in. Reflectors (Sixteenth Series). A. van Maanen	2331
Comparison of Spectroscopic and Trigonometrical Parallaxes. H. N. Russell and C. E. Moore	2760
Object-Glass Diaphragms in Photoelectric Stellar Photometry. M. Güssow	3129
Distribution of Stars in the Cape Astrographic Zone, — 40° to — 52°. J. Jackson	3142
Distribution of Absolute Magnitudes in the Vicinity of the Sun. W. J. Luyten	3587
Half-Filter Method of Photographic Photometry of Stars. O. Heckmann and H. Kienle	4833
Photographic Red-Intensities of Praesepe. O. Heckmann	4838
Colour-Luminosity Diagram of Praesepe. H. Haffner and O. Heckmann	4839
Scatter of Absolute Magnitudes in the Main Sequence. J. Hopmann	4840

2. Motions.

First List of Objective-Prism Radial Velocities (Fields in Taurus and Cygnus). B. J. Bok and S. W. McCuskey. Notes on Southern Objective-Prism Radial Velocities and on the Absorption Filter. B. Cherry	1034
Stream Motions of 85000 Faint Proper-Motion Stars. M. J. Luyten	1035
Correlation of Radial Velocities and K-Term with Distances of B-Stars. J. M. Mohr	1513
Rotation of the Galaxy. E. Esclangon	1514
Stellar Groups Moving with the Sun. L. Gialanella	1536
Parabolic Double-Star Orbit. R. v. d. R. Woolley	2332
Motion of the Apsidal Line in Close Binary Systems. Z. Kopal	2754
Ellipticity of Close Binaries. W. J. Luyten	2755
Radial Velocities of Some Early-Type Stars. R. F. Sanford and P. W. Merrill	2761
Radial Velocities of 917 Stars. W. E. Harper	2762
Spectroscopic Orbits of H.R. 5472. W. E. Harper and G. H. Blanchet	2763
New Method of Differential Measures of Proper Motions. J. Clavier	3143
Photographic Deduction of the Proper Motions of Stars. G. Bemporad and A. M. Vergnano	3144
Constants of Star-Streams from Photographic Proper Motions of 1775 Stars. W. M. Smart and T. R. Tannahill	3145
Analysis of the K Term in B-Type Stars. J. S. Plaskett	3146
Proper Motions in Fields of Stars with Large Motion. A. van Maanen	3147
Radial Velocities of 600 Stars and Measures of 69 Spectroscopic Binaries. W. H. Christie and O. C. Wilson	3148
Multiplet Calibration of the Arcturus Spectrum. S. G. Hacker	3149

Stars, *continued.*

Abstract Nos.

Method of Deriving Constants of Velocity Ellipsoid from Observed Radial Speeds of Stars. W. M. Smart and S. Chandrasekhar 3588
Stellar Groups Moving with the Sun. L. Gialanella 4413
Motion of Apsidal Line in Close Binary Systems. T. G. Cowling 4835
Generalisation of Lindblad's Theory of Star-Streaming. S. Chandrasekhar .. 4841
Radial Velocity-Curve of the RR Lyræ Variable W Canum Venaticorum. A. H. Joy 4842

3. Spectra.

Colour Indices of O and B Stars and Selective Absorption of Light in Space. J. Dufay and Ssu-Piu Liau 101
Continuous Hydrogen Absorption of cA Stars. Y. Öhman 523
New Solutions of the Equation of Radiative Transfer. L. Spitzer, Jr. 524
Unidentified Interstellar Lines in the Yellow and Red. P. W. Merrill and O. C. Wilson 525
Line Intensities in U.V. Stellar Spectra. L. H. Aller and L. G. Stoddard 526
Excitation of Emission Lines in Extended Chromospheres by Electron Impact. K. Wurm 527
Contours of Hγ and Hδ in γ Cephei. C. J. Krieger 532
Excitation of Emission Lines in Late-Type Variables. A. D. Thackeray 533
Infra-Red Stellar Surveys and Index Sequences. C. Hetzler 534
Relative *f*-values for Lines of Fe I and Ti I. R. B. King and A. S. King 537
Visual Colour Excess of Bright Stars in Cepheus. K. Graff 1036
Colour Estimates of Stars with Larger Instruments. K. Graff 1037
Henry Draper Charts of Stellar Spectra. A. J. Cannon 1038
Effect of Absorbing Clouds on General Absorption Coefficient. J. L. Greenstein 1039
Continuous Hydrogen Absorption of White Dwarfs. Y. Öhman 1040
Red Indices of Stars in Eight Southern Selected Areas. C. Payne-Gaposchkin 1041
Red Indices in Galactic Clusters. J. Cuffey 1042
Astronomical Spectroscopy. A. Hunter 1043
Stark Effect in Stellar Spectra. O. Struve 1515
Ultra-Violet Absorption Spectra of Early-Type Stars. W. S. Adams and T. Dunham, Jr. 1516
Studies Based on the Intensities and Displacements of Interstellar Lines. P. Merrill and R. F. Sanford 1517
Determination of Selective Absorption Based on the Spectrophotometry of Reddened B Stars. J. L. Greenstein 1518
Relation Between Red and Yellow Colour Indices in Harvard Standard Region C4. J. L. Greenstein 1903
Spectrophotometric Investigations of δ Cephei Stars. Part IV. (S. Sagittæ). W. Strohmeier 1904
Absorption of Light in Space. S. Rosseland 1905
Line Profiles. R. O. Redman 1906
Spectrophotometric Applications of Wood Replica Gratings. F. L. Whipple and D. Norman 2317
Absorption Line at $\lambda 4430 \cdot 6$ of Possible Interstellar Origin. C. S. Beals and G. H. Blanchet 2333
Curves of Darkening in Photographic Astrophotometry. H. Grouiller 2334
Atomic Lines in the Spectrum of Antares. D. N. Davis 2335
Possibility of Detecting H_2 and N_2 in Planetary and Stellar Atmospheres by their Rotation-Vibration Spectra. G. Herzberg 2336
Quadrupole Rotation-Vibration Spectrum of H_2. H. M. James and A. S. Coolidge 2337
Colour Indices of Stars from a Classification of their Spectra. W. W. Morgan 2338
Ionisation and Recombination in the Theory of Stellar Absorption Lines and Nebular Luminosity. S. Chandrasekhar 2339
Method of Determining Interstellar Coloration of Faint Stars. W. Becker .. 2347
Visual Colour Excesses of Bright Stars in Cassiopeia. K. Graff 2764
Estimation of Spectral Type and Luminosity in B-Type Stars. E. G. Williams and D. L. Edwards 2765
New Soluble Case of the Equation of Transfer for a Line Frequency. M. Krook 2766
Evidence for Complex Structure in Lines of Interstellar Sodium. C. S. Beals .. 2767
Spectrum of γ Cassiopeiae in the Photographic Region. R. B. Baldwin 2768

For the **Key** to this Index see pp. 1182 to 1194.

Stars, *continued.*

Abstract Nos.
Excitation of Absorption Lines in Outer Atmospheric Shells of Stars. O. Struve and K. Wurm 3150
Spectrophotometric Investigations of δ Cephei Stars. Part V. (RT Aurigae). W. Becker and W. Strohmeier 3589
Non-Coherent Formation of Absorption Lines. R. v. d. R. Woolley 3590
Absorption of Light by the Atmosphere. A. Vassy and E. Vassy 3621
Theory of Cyclical Transitions. L. G. Henyey 3995
Spectrum of γ-Cassiopeiae. J. F. Heard 4390
Lines of Ionised Barium in Stellar Spectra. C. G. Burwell. 4391
Relationship Between Colour, Spectrum and Absolute Magnitudes for G-Type Stars. J. S. Hall 4392
Spectrum and Radial Velocity of γ Persei. D. B. McLaughlin 4393
Displacements of Absorption Lines in the Spectrum of P Cygni. E. K. Kharadse 4394
Compilation of Data for Stronger Lines in α Cygni Spectrum. A. B. Wyse .. 4395
Relative Energy Distribution in the Continuous Spectrum of 36 Fundamental Stars. H. Kienle, H. Strassl and J. Wempe 4396
Occurrence of Metallic Absorption in Celestial Spectra. L. Biermann 4414
Tables Facilitating Calculation of Line Absorption Coefficients. F. Hjerting 4843
Integration of Equation of Radiative Transfer. P. Swings and L. Dor 4844

4. Temperature.

Intensity Effect on Colour Temperature. W. Becker and G. Hartwig 102
Distribution of Temperature in Stellar Atmospheres. E. R. Mustel 1519
Colour Temperature Variations of γ Cassiopeiae, and the problem of "Yellow" B-Type Stars. W. M. H. Greaves and E. Martin 2769
Thermal Agitation in the Presence of a Gravitational Field. E. Sevin 3151
Temperature Distribution in Stellar Interiors. G. Tiercy 3996

5. Constitution and Evolution.

Mass-Luminosity Relation. É. Sevin 103
Rôle of the Source of Stellar Energy. É. Sevin 104
Stability of Radiative Gradients in the Interior of a Star. S. Chandrasekhar 105
Properties of Eddington Model Star. W. Gleissberg 106
Minimum Theorem in the Theory of Internal Constitution of Stars. W. Gleissberg 1044
Theory of Pulsations. M. Schwarzschild 1045
Scattering of Light in Stellar Atmospheres. P. Wellman 1046
Impossibility of Permanent Rotation in a Fluid Star with Elliptical Stratification. P. Dive 1047
Origin of Stellar Energy. L. Landau 1520
Impossibility of Stratification of Liquid Rotating Stars. C. Mineo 1521
Fitting Atmospheres to Stars. H. N. Russell 1522
Ionisation in Stellar Atmospheres. M. Krook 1523
Star Model with Selective Thermo-Nuclear Source. G. Gamow 1524
General Circulations and their Perturbations. A. Giào 1548
Dissociation of Molecules in the Carbon Stars. Y. Fujita 1907
Neutrons and White Dwarfs. M. C. Johnson 1908
Nuclear Energy Sources and Stellar Evolution. G. Gamow 1909
Relation of Electron Gas Pressure to Radiation Pressure in Degeneracy and Non-Degeneracy. D. S. Kothari and B. N. Singh 1910
Theory of Pressure-Ionisation and its Applications. D. S. Kothari 1911
Form of Rotating-Gas Configurations. Z. Kopal 2340
Square of Angular Velocity of Fluid Star Expressed as Analytic Function. P. Dive 2341
Theory of Planets and White Dwarf Stars. A. Sommerfeld 2757
Helium and Hydrogen Content of the Interior of the Stars. B. Strömgren .. 2770
Integral Theorem on the Equilibrium of a Star. S. Chandrasekhar 2771
Minimum Integral in the Theory of Internal Constitution of Stars. W. Gleissberg 2772
Origin of the Planets. R. A. Lyttleton 3138
Stability of Convective Stars. T. G. Cowling 3152
Existence of Stellar Systems in a Quasi-Steady State of Motion. B. Lindblad 3153
Form of Rotating-Gas Configurations. Part II. Z. Kopal 3154

For the **Key** to this Index see pp. 1182 to 1194.

Stars, *continued.*

Abstract Nos.

Mass-Luminosity Law and Tidal Deformation of Stars. K. Walter 3155
Chemical Composition and Dynamical Stability of Stars. L. Biermann 3591
Rate of Stellar Radiation. C. H. Collie 3592
Relation of Electron Gas Pressure to Radiation Pressure in Degeneracy and Non-Degeneracy. D. S. Kothari and B. N. Singh 3593
Compton Scattering of Radiation in a Star. A. R. Severny 3594
Formation of Deuterons by Proton Combination. H. A. Bethe and C. L. Critchfield 3834
Influence of Radiation on Ionisation Equilibrium. B. N. Srivastava 3961
Convective Stability of Stellar Atmospheres Comprised of Doubly Ionised Atoms. Y. Fujita 3997
Density Condensations in Stellar Interiors. Z. Kopal 3998
Nuclear Transformations as the Source of Stellar Energy. G. Gamow 3999
Theorems in Stellar Structure. W. Gleissberg 4000
Non-Radial Oscillations of Stars. Part I. C. L. Pekeris 4001
Two Elementary Theorems on Polytropes. N. R. Sen 4397
Nature of Primary Cosmic Radiation. T. H. Johnson 4473
Nuclear Transformations in the Interior of Stars. Part II. C. F. v. Weizsäcker 4845

6. Galactic System.

Diffusion of Light in the Milky Way. J. Dufay 107
Galactic Rotation Constants from Open Clusters. H. Mineur 108
Origin of Cosmic Radiation. Part II. H. Alfvén 631
Galactic Structure. Part I. Counts of Stars with Apparent Photographic Magnitudes Brighter than 13·5 in the Southern Hemisphere. E. M. Lindsay and B. J. Bok. Part II. The Milky Way from Aquila to Cygnus. F. D. Miller 1048
Cosmic Radiation as an Intra-Galactic Phenomenon. H. Alfvén 1136
Distribution of 89000 Galaxies over the South Galactic Cap. H. Shapley 1912
Gravitational Potential of the Galaxy. H. Mineur 3156
Change of Luminosity Function with Height above Galactic Plane. J. L. Greenstein 3595
Theory of Interstellar Absorption. J. L. Greenstein 4002
Galactic Structure in Taurus. Part I. Surface Distribution of Stars. S. W. McCuskey 4398
Space Distribution of F-Type Stars. M. A. Vashakidse 4399
Distribution of A, F and G Type Stars Perpendicular to the Galactic Plane and in the Direction to the Galactic Centre. M. A. Vashakidse 4400

7. Star Clusters and Clouds.

Equilibrium of Stellar Clusters. H. Mineur 528
Space Distribution of White Stars in the Direction of the Galactic Centre. Å. Wallenquist 1049
Comparison of Magnitude Sequences in the Two Magellanic Clouds. J. Mohr 1050
Photographs of Southern Clusters and Nebulae. J. S. Paraskevopoulos 1051
Position of Three Galactic Clusters in the Hertzsprung-Russell Diagram. L. Gratton 1052
Dynamic Equilibrium of Galactic Clouds. H. Mineur 1053
Photometry of Stars and Clusters in the Southern Spiral, NGC 7793. H. Shapley and J. Mohr 1525
Stroobant Cluster. A. Festraets 1526
Globular Cluster Messier 92. J. J. Nassau 1913
Stellar System of New Type. H. Shapley 2342
Theoretical Analysis of Wolff's Method of Star Counts in Dark Regions. K. Ogorodnikoff 3596
Diffuse Nebulae and Cosmic Absorption. V. A. Ambarzumian and S. G. Gordeladse 4387
Emission Interstellar Nebulosities in Cygnus and Cepheus. O. Struve and C. T. Elvey 4401

9. Variable Stars, Binaries and Novæ.

Photometric Study of the Variable B.D.–1°1004. J. Ellsworth 109
Variable Star of Type W Ursæ Majoris in Præsepe. H. Haffner 110

For the **Key** to this Index see pp. 1182 to 1194.

Stars, *continued.*

Abstract Nos.
Photographic Observations of Nova Lacertæ, 1936. P. Rossier 111
Objective Prism Observations of Nova Lacertæ (1936). D. L. Edwards and D. R. Barber 529
Variables in Kapteyn's Selected Areas 2–19. E. A. Baker 530
Spectrophotometric Study of Algol Minima. Tcheng Mao-Lin 531
Contours of $H\gamma$ and $H\delta$ in δ Cephei. C. J. Krieger 532
Excitation of Emission Lines in Late-Type Variables. A. D. Thackeray 533
Infra-Red Stellar Surveys and Index Sequences. C. Hetzler 534
Interpretation of Epsilon Aurigæ. G. P. Kuiper, O. Struve and B. Strömgren . . 535
Spectrophotometric Study of Nova Ophiuchi 1933 in the Intermediate Stages. A. R. Sayer 1054
Masses in Single-Spectrum Binary Systems. H. C. Plummer 1055
Tremblot Spectrogram of β-Lyræ. J. G. Baker 1056
Distant Variable Stars in Low Galactic Latitude. H. Shapley and C. D. Boyd 1057
Changes of Period in Long-Period Variables. T. E. Sterne and L. Campbell 1058
New Eclipsing Star of Unusual Character. M. W. Mayall 1059
System of α Ursæ Majoris. H. Spencer Jones and H. H. Furner 1060
Peculiar Variable with Changing Period and Light Curve. H. H. Swope 1061
Four Peculiar Variable Stars. S. Gaposchkin 1062
Asymmetry of Light Curves in the Great Sequence as a Function of Frequency of Period. S. Gaposchkin 1063
Complex Variation of DF Cygni. M. Harwood 1064
Boss 5442 (V389 Cygni). P. Guthnick 1065
Observations of Variable Stars by the American Association of Variable Star Observers. L. Campbell 1527
Variable Star VV Cephei as an Eclipsing System. S. Gaposchkin 1528
Differential Correction of the Orbit of a Visual Binary. W. H. van den Bos.... 1529
Orbital Elements of Visual Double Stars. A. Danjon 1530
Photographic Magnitudes of Super-Nova 145. 1937 Persei in N.G.C. 1003. A. Beer and C. C. L. Gregory 1531
Bright Nova of 1860 in Globular Cluster Messier 80, and its Relation to Supernovæ. H. B. Sawyer 1532
Features of a Planetary Nebula and a Nova. Y. Hagihara 1533
Spectrographic Studies of Nova Lacertæ 1936. W. E. Harper, J. A. Pearce, C. S. Beals, R. M. Petrie, A. McKellar 1914
Early Stages of Nova Herculis. Part II. Bright Line Spectra. F. L. Whipple and C. Payne-Gaposchkin 1915
Double Stars. W. H. van den Bos 1916
System of Algol. W. J. Luyten 1917
Eclipsing Star WZ Ophiuchi. S. Gaposchkin 1918
Photoelectric Observations of Eclipsing Binary 44i Bootis B. H. Shapley and W. A. Calder 1919
Spectroscopic Multiples, 52 and 58 Persei. R. Tremblot. 1920
Secondary Variation of μ Scuti. T. E. Sterne 1921
Radiometric Magnitude of Epsilon Aurigæ. R. M. Emberson, R. Loevinger, and T. E. Sterne 2343
System of α Ursae Majoris. H. Spencer Jones and H. H. Furner 2344
Spectral Variation of P Cygni. P. Lacroute 2345
Orbit of the Visual Binary $O\Sigma77$ and the Mass-Luminosity Relation. G. Durand 2346
Eclipsing Variable Star μ^1 Scorpii. P. Rudnick and C. T. Elvey 2773
Spectrum of Nova Herculis. G. Järnefelt 2774
Observations by American Association of Variable Star Observers. L. Campbell 3157
Discovery of Quintuple Star. A. Bemporad 3158
Rotational Effect in Eclipsing Binaries and Stellar Dimensions. R. M. Petrie 3159
Epsilon Aurigæ. O. Struve and H. B. Lemon 3160
Origin of Binary Stars. R. A. Lyttleton 3577
Evolution of Eclipsing Binaries. Z. Kopal 3578
Observations of Novæ, 1937-1938. W. H. Steavenson 3597
New Spectrum Variable : 5 Lacertae. J. A. Hynek 4003
Photometric Observations in Different Colour Regions of the System U Sagittæ. K. Walter 4004
Hydrogen Band Width in Nova Herculis. E. G. Williams 4005
Bright Line Intensities in Nova Pictoris Spectrum. C. Payne-Gaposchkin and D. H. Menzel 4006

For the **Key** to this Index see pp. 1182 to 1194.

Stars, *continued.*

Abstract Nos.

Light-Curves of Cepheids. M. Schwarzschild 4007
Eclipsing Binaries with Apsidal Motion. H. Shapley and H. Swope 4008
Observations by American Association of Variable Star Observers. L. Campbell 4009
New Southern Double Stars. (Third List). R. A. Rossiter 4402
Quadruple System, 59 Serpentis. R. Tremblot 4403
Spectroscopic Triple Star 59d Serpentis. D. B. McLaughlin 4404
Present Spectral Characteristics of Sixteen Old Novæ. M. L. Humason 4405
Absolute Photographic Magnitude of Supernovæ. W. Baade 4406
Mass Ejected during Nova Outburst. S. G. Gordeladse 4407
Final-Phase Temperatures of Novæ. S. G. Gordeladse 4408
Energy Liberated during Nova Outburst. S. G. Gordeladse 4409
Microphometer Measurements of Variable Star SU Draconis in 1935–1936. W. Opalski 4846
Photographic Light-Curves of the Two Supernovæ in IC 4182 and NGC 1003. W. Baade and F. Zwicky 4847

9. Catalogues and Stellar Photography.

Reference Stars for the Opposition of Eros, 1931. H. Spencer Jones and P. J. Melotte 517
Comparison between the Right Ascensions of the Second Greenwich Catalogue of Stars for 1925·0 and of the FK$_3$. W. M. H. Greaves 536
Measures of 1865 A Double Stars. R. G. Aitken 1066
Catalogue of 1113 Galaxies in a Region in Fornax and Eridanus. R. H. Baker 1922
Photography in the Exploration of the Universe. H. Spencer Jones 2433
Catalogue of Orbits of Visual Binary Stars. P. Baize 2775
Reduction of Visual Catalogues to the Harvard Photovisual System. C. Payne-Gaposchkin 4010
Spectral Classification in Kapteyn's Selected Areas. H. Brück 4848

10. Unclassified.

Wave-Mechanics and Stellar Theory. H. Jehle 2320
Refractive Index of Interstellar Space. E. Schoenberg 2776
Theory of Absorption in Ionised Gas. Part I. Opacity in Stellar Material. Part II. Optical Properties of Liquid Metals. B. Majumdar 4463

Sun.

1. Chromosphere and Prominences.
2. Corona. Eclipse.
3. Sunspots and Faculæ.
4. Temperature.
5. Parallax, Size, Motion.
6. Spectrum.
7. Magnetism.
8. Unclassified.

Cross-Reference :
Solar Radiation, *see* Meteorology.

1. Chromosphere and Prominences.

Astrophysical Problems of the Ionosphere. N. E. Bradbury, A. G. McNish, J. H. Dellinger, R. S. Richardson 371
Chromospheric Eruptions and Ionospheric Disturbances. M. Waldmeier 372
Position Measurements of Granules on the Sun. P. ten Bruggencate and W. Grotrian 543
Dynamics of Solar Prominences. K. O. Kiepenheuer 1067
Rotation Velocity of Solar Prominences. L. and (Mme.) d'Azambuja 1923
Solar Activity (Prominences). A. L. Narayan 1924
Eruptive Prominences. M. Waldmeier 2777
Terrestrial Magnetism and Chromospheric Eruptions. J. Coulomb and G. Dugast 3186
Height of the Chromosphere in 1937. G. Abetti 3598
Brightness Variations and Structure of Solar Granulation in the Ultra-Violet. P. ten Bruggencate, W. Grotrian and E. v.d. Pahlen 3599
Solar Prominences. Part I. M. Waldmeier 4410
Prominence Studies. R. R. McMath and E. Pettit 4411
Dimensions of Solar Granules. P. C. Keenan 4412

2. Corona. Eclipse.

Mercury's Transit across the Corona. B. Lyot 100
Solar Wave-Length Displacements Observed at the Japan Eclipse of June 19, 1936. T. Royds 112

Sun, *continued.*

Abstract Nos.

Ionosphere during Solar Eclipse, June 8th, 1937. I. Ranzi 370
Contours of Coronal Lines. M. Waldmeier 1068
Spectrum of Solar Corona at Total Eclipse in 1936. Part II. Continuous Spectrum. T. Tanaka, Z. Koana and M. Kondô 1534
Observations of Solar Corona and Protuberances from Pic du Midi, 1937. B. Lyot 1925
Total Light and Colour of the Solar Corona of June 8th, 1937. J. Stebbins and A. E. Whitford 1926
Ionospheric Observations: Eclipse of June 8th, 1937. H. W. Wells, H. E. Stanton and S. L. Seaton 2192
Coronal Polarisation. W. M. Cohn 2348
Twilight Phenomena during Total Solar Eclipses. F. Link 2369
Sunspot Activity and the Form of the Solar Corona. W. E. Bernheimer 3161
Ionospheric Eclipse of 1940, Oct. 1st 4011
Corpuscular Eclipse of 1940, Oct. 1st 4849

3. Sunspots and Faculæ.

New Approach to Study of Terrestrial Solar Relationships. J. W. Mauchly 582
Solar Activity and Haloes. H. Neuberger 1092
Sudden Short-Wave Fading, and its Relation to Magnetic and Solar Phenomena. R. Jouaust, R. Bureau and L. Éblé 1346
Statistical Analysis of the Rhythm of Latent Regularities in Depths. K. Brodovitskij 1456
Solar Activity (Sunspots). H. W. Newton 1927
Mean Areas and Heliographic Latitudes of Sunspots in the Year 1936 2349
Sunspot Influences. R. E. de Lury 2778
Probable Existence of Maximum Activity on Sun. I. L. Thomsen 2779
Stability Index of Solar Activity. H. Mémery 2780
Two Solar Eruptions. J. C. Dobbie, W. Moss and A. D. Thackeray 3600
Application of Line Integral Theorems of Hydrodynamics to Terrestrial and Cosmical Vortices. H. Philipps 4035
Halo Phenomena and Solar Activity. G. Archenhold 4046

4. Temperature.

Relative *f*-Values for Lines of Fe I and Ti I. R. B. King and A. S. King 537
Temperature in the Solar Reversing Layer Derived from Titanium Lines. R. B. King 538
Effect of an Adiabatic Layer upon Solar Limb Darkening. P. C. Keenan 539
Equivalent Widths and the Temperature of the Solar Reversing Layer. D. H. Menzel, J. G. Baker and L. Goldberg 1535

5. Parallax, Size, Motion.

Stellar Groups Moving with the Sun. L. Gialanella 1536
Stellar Groups Moving with the Sun. L. Gialanella 4413

6. Spectrum.

Solar Wave-Length Displacements Observed at the Japan Eclipse of June 19th, 1936. T. Royds 112
Relative f-Values for Lines of Fe I and Ti I. R. B. King and A. S. King 537
Temperature in the Solar Reversing Layer Derived from Titanium Lines. R. B. King 538
Effect of an Adiabatic Layer upon Solar Limb Darkening. P. C. Keenan 539
Contours of Lines at the Extreme Limb of the Sun. R. v. d. R. Woolley 540
Fundamental Arc Series in Sodium and its Presence in the Sun. P. Rood and R. A. Sawyer 541
Age of the Sun, Disintegration Constant of ACU and the Mass Proportions Pb to Th to U on the Earth. S. Meyer 542
Astronomical Spectroscopy. A. Hunter 1043
Spectrophotometry of the Chromosphere, 1932. H. H. Lane 1069
Variation of Faint Fraunhofer Lines across the Solar Disc. M. G. Adam 1070
Spectrum of Solar Corona at Total Eclipse in 1936. Part II. Continuous Spectrum. T. Tanaka, Z. Koana and M. Kondô 1534

Sun, *continued.*

Abstract Nos.

Red Shift of the D Lines of Sodium in the Sun. J. Evershed 1537
Spark Spectrum of Iron, $\lambda\lambda$5016–7712 with Indentifications of Fe II Lines in the Solar Spectrum. A. S. King 1538
New Band in the Absorption Spectrum of the Earth's Atmosphere. A. Adel and C. O. Lampland 1554
Absence of Continuous Absorption in the Solar Spectrum. M. Minnaert and J. K. van den Briel 2350
Molecular Carbon in the Solar Spectrum. M. G. Adam 3162
Non-Coherent Formation of Absorption Lines. R. v. d. R. Woolley 3590
Changes of Strong Fraunhofer Lines from Centre to Edge of Sun's Disc. J. Houtgast 3601
New Anomalous Effect in the Short-Wave End of the Solar Spectrum. S. Rodionov, E. Pavlova, and N. Stoopnikov 3602
Fraunhofer Intensities in the Infra-Red Region. C. W. Allen 4012
Analysis of Infra-Red Limit of Atmospheric Transmission. A. Adel and C. O. Lampland 4013
Rock-Salt Prismatic Solar Spectrum. A. Adel 4014
Origin of Infra-Red Telluric Absorption Band q_2 A. Adel 4015
Occurrence of Metallic Absorption in Celestial Spectra. L. Biermann 4414
Hydrogen Lines near the Balmer Limit. A. Pannekoek 4850

7. Magnetism.

Physical Causes of Earth's Magnetism. H. Haalck 1946
Interpretation of Terrestrial and Solar Magnetic Fields. J. Mariani 2815
Influence of the Solar Magnetic Field Upon Cosmic Rays. P. S. Epstein. .. 2855
Solar Magnetism. V. C. A. Ferraro 4415

8. Unclassified.

Apparent Enlargement of the Sun at Rising and Setting. V. Cornish 544
Photoelectric Comparison of Brightness of the Sun, Moon, Capella, Vega, and Deneb. W. A. Calder 1071
Age of the Sun and Disintegration Constant of AcU. Part II. S. Meyer 2781
Astrophysics at North Pole. B. G. Fessenkoff 4416

Surface Properties.

1. Adsorption:
    (*a*) Gases.
    (*b*) Liquids.
2. Surface Tension.
3. Surface Structure.
4. Parachors.
5. Films, *see also* Surface Structure.
6. Cohesion and Adhesion.
7. Lubrication.
8. Electrical Phenomena at Interfaces.
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References:
Electrokinetic Phenomena, *see* Colloids.
Lubrication, *see also* Section B.—Electrical Engineering.

1. Adsorption.

(*a*) *Gases.*

Special Type of Reciprocal Effect of Molecules in the Adsorption Layer. N. I. Kobosev and J. Goldfeld 75
Separation of Fluorine from Oxygen by Adsorption and Rectification. E. Kanda 76
Adsorption of Gases in an Electric Field. O. Blüh 77
Adsorption and Surface Structure. J. H. de Boer and J. F. H. Custers 80
Quenching of Fluorescence of Solids by Adsorbed Gases. V. Hachkovski and A. Terenin 161
Adsorption Isotherms and Heats of Adsorption of Oxygen and Carbon Monoxide on Charcoal. A. van Itterbeek and W. van Dingenen 486
Intermolecular Forces in Two-Dimensional Systems. R. C. L. Bosworth and E. K. Rideal 487
Surface Areas of Various Adsorbents. S. Brunauer and P. H. Emmett........ 488
Liberation of Secondary Electrons from Adsorbed Layers. O. Krenzien 859
Correction for Adsorption in the Method of Determining Limiting Densities. E. Moles 943

For the **Key** to this Index see pp. 1182 to 1194.

Surface Properties, *continued.*

Abstract Nos.
Gases in Metals. Part IV. J. A. Kljatschko 986
Adsorption of Gases by Solids. E. K. Rideal 987
Statistical Mechanics of the Adsorption of Gases at Solid Surfaces. F. J. Wilkins 988
Adsorption of A, N_2 and O_2 on Smooth Pt Foil at Low Temperatures and Pressures. F. J. Wilkins 989
Rates of Deposition of Oxygen upon Tungsten. M. C. Johnson and A. F. Henson 1364
Adsorption of Gases in Multimolecular Layers. S. Brunauer, P. H. Emmett and E. Teller 1479
Sorption Hysteresis and the Vapour Pressure of Concave Surfaces. L. H. Cohan 1480
Adsorption of Gases on Plane Surfaces of Mica. M. H. Armbruster and J. B. Austin 1481
Condensation and Adsorption of Mercury Vapour. R. C. Mason 1482
Adsorption of Dimethyl, Diethyl, and Di-*n*-propyl Ethers by Activated Charcoal. J. N. Pearce and P. E. Peters 1483
Intermolecular Forces in Two-Dimensional Systems. R. C. L. Bosworth and E. K. Rideal 1484
Adsorption of Gases on Surfaces as a Particular Case of Dissociative Equilibrium. F. Cernuschi 1854
Orientation of Molecules in the Surface Layer of an Adsorbent and the Adsorption of Gases. Part II. B. A. Talmud and D. L. Talmud 1855
Adsorption of He on Charcoal below 78°K., and Production and Thermometry of Low Temperatures. E. Kanda 1856
Heat of Adsorption of He Gas near 1°K. J. W. Stout and W. F. Giauque 1857
Adsorption of Vapours at Plane Surfaces of Mica. Part I. D. H. Bangham and S. Mosallam 1858
Superlattice Formation of the Type AB in Alloys with Applications to the Theory of Adsorption. T. S. Chang 2237
Activated Adsorption of Methane on Reduced Nickel. M. Kubokawa 2295
Air Adsorbed on Drops. W. Riedel 2296
Adsorption of H_2 by Cu Dispersed in MgO. J. R. Lewis and H. S. Taylor 2297
Statistical Theory of Adsorption with Long-Range Interaction. J. S. Wang 2298
Clean-Up of Inert Gases in an Electric Discharge. Parts II and III. H. Alterthum and A. Lompe 2555
Adsorption of Vapours at Plane Surfaces of Mica. Part II. D. H. Bangham and S. Mosallam 2731
Limiting Density of SO_2. E. Moles, T. Toral and A. Escribano 3064
Sorption of Chlorine by Activated Charcoal. L. H. Reyerson and A. W. Wishart 3109
Adsorption of Gases by Graphite. A. B. Lamb and E. N. Ohl 3110
Adsorption of He on Charcoal. A. van Itterbeek and W. van Dingenen 3111
Adsorption on a Uniform Surface. J. B. Zeldowitsch 3112
Adsorption of H_2 and O_2 on Pt at High Temperatures. B. Erschler, G. Deborin, and A. Frumkin 3113
Sorption of Vapours by Cellulose and Derivatives. K. Kanamaru and J. Chao 3542
Activation of Charcoal by $ZnCl_2$. G. G. Kandilarow 3543
Theory of Cooperative Phenomena. G. S. Rushbrooke 3544
Statistical Theory of Adsorption. Part I. F. Cernuschi 3545
Properties of Mobile and Immobile Adsorbed Films. J. K. Roberts 3546
Kinetics of Adsorption with Long-Range Interaction between Adsorbed Particles. J. S. Wang 3547
Adsorption. P. Harteck 3548
Differential Method for the Measurement of Small Amounts of Adsorbed Gases. W. Hunsmann 3549
Energy Exchanges at Boundary Surfaces. H. J. de Boer 3760
Absolute Rates of Heterogeneous Reactions. Part I. General Theory of Adsorption. G. E. Kimball 3787
Mechanism of the Adsorption Process. Part I. A New Theory of Adsorption. B. M. Gouguell and E. Ruderman 3967
Retention of Vapours by Active Gels. F. Krezil, F. Schätzler and E. Brixel 3968
Gases and Metals. C. J. Smithells 3969
Rate of Adsorption of Gases by Porous Materials. E. Wicke 3970
Adsorption of O_2 by Molten Ag. T. Gerassimoff. 3971
Adsorption of N_2 and O_2 on W. A. B. van Cleave 3972

For the **Key** to this Index see pp. 1182 to 1194.

Surface Properties, *continued.*

Abstract Nos.

Sorption of Polar and Non-Polar Gases by Zeolites. R. M. Barrer 3973
Adsorption and Desorption of Hydrogen at Platinum Electrodes. J. D. Pearson and J. A. V. Butler 4220
Influence of Adsorption Layers upon the Impact of Positive Cæsium Ions in Tungsten. H. Paetow and W. Walcher 4267
Duration of Energy Interchange between Gas-Molecules and a Solid Surface. W. Hunsmann 4353
Thermal Properties and Heats of Adsorption of Films on Vitreous Silica. W. G. Palmer 4354
Gas Absorption and Optical Constants of Thin Metal Foils. M. Kindinger and K. Koller 4503
Theory of Adsorption when Each Particle Occupies More than One Site. J. K. Roberts 4815
Electrical Factors in the Adsorption of Polar Molecules at the Surface of Solutions. R. DuBois and E. E. Todd 4816
Effects of Dipole Interactions on Heats of Adsorption. J. K. Roberts 4817
Induced Dipoles and Heat of Adsorption of Argon on Ionic Crystals. J. K. Roberts and W. J. C. Orr 4818
Relative Adsorbabilities of H_2 and D_2. A. Wheeler 4819

(*b*) *Liquids.*

Bonding Force of Cellulosic Materials for Water. A. J. Stamm and L. A. Hansen 18
Wetting and Corrosion of Metals in Polyphase Systems. Part IV. D. I. Mirlis 78
Heats of Wetting of Cellulose by Alcohols and their Aqueous Solutions. J. L. Morrison, W. B. Campbell and O. Maass 489
Heat of Sorption of Solvents by Nitrocellulose. Part II. S. Papkov and V. Kargin 490
Simple Formulæ for the Adsorption of Mixtures. A. Boutaric 990
Adsorption of Acetic Acid by Animal Charcoal. M. Dobine 991
Adsorption at the Mercury Drop Electrode and Maxima of the Polarographic Current-Voltage Curves. A. Winkel and H. Siebert 1303
Adsorption of Solvent and Solute from a Concentrated Solution. M. Dobine 1485
Simultaneous Adsorption from Dilute Aqueous Solutions. W. J. Jones, R. A. Hudson and J. T. Jones 1486
Surface-Bound Versus Capillary-Condensed Water in Wood. A. J. Stamm and L. A. Hansen 1487
Adsorption in the Coagulation of Sols by Electrolytes. H. B. Weiser, W. O. Milligan and W. J. Coppoc 1778
Behaviour of Liquid Drops and Adsorbed Films at Cleavage Surfaces of Mica. D. H. Bangham and Z. Saweris 1859
Wetting of Pigments. E. Sauer and W. Gussmann 1860
Photo-Decomposition of Absorbed Acetone. W. Kudrjawzewa and N. Prileshajewa 1997
Melting Temperatures of Compounds Absorbed on Silica Gel. W. A. Patrick and W. A. Kemper 2073
Effect of Surface Forces on Melting. W. A. Patrick and W. A. Kemper 2074
Isoelectric Point of Cellulose. Adsorption and Swelling. J. Gavoret 2224
Adsorption on Curved Surfaces and Emulsification. H. M. Cassel 2299
Sorption of Water by Rubber. R. L. Taylor and A. R. Kemp 2300
Anomalous Adsorption in Photographic Phenomena. Lüppo-Cramer 2432
Optical Investigations of the Adsorption of Porphyrins. F. Bandow 2466
Chemisorption on Charcoal. H. H. Chambers and A. King 2732
Swelling of Charcoal. Part V. Saturation and Immersion Expansions and Heat of Wetting. D. H. Bangham and R. I. Razouk 2733
Linear Adsorption on Two-Dimensional Colloids. P. F. Pochil, T. I. Silberman and D. L. Talmud 3114
Theory of Adsorption from Solutions. A. Schuchowitzky 3115
Adsorbability of Chain Molecules. A. Baum and E. Broda 3116
Anomalous Adsorption in Photographic Phenomena. Lüppo-Cramer 3222
Kinetic Processes in Boundary Surfaces. K. Neumann 3517
Heats of Adsorption of Alkalis by Standard Cellulose. J. L. Morrison, W. B. Campbell, and O. Maass 3550
Primary and Secondary Adsorption of Metallic Ions at Metal Surfaces. O. Erbacher 3974
Displacement of Equilibrium by Adsorption of Metal Ions on Pt. O. Erbacher 3975

Surface Properties, *continued.*

Abstract Nos.
Wetting and Corrosion of Metals in Polyphase Systems. Part V. D. I. Mirlis 3976
Surface Activity of Aqueous Solutions of Organic Ions with Hydrophobic Groups. Y. Mutō 4355
Adsorption of Metal Ions at Metal Surfaces. O. Erbacher 4356
Adsorption of Colloidal Graphite from Oleosols at Metallic Surfaces. F. Pavelka and A. Wischin 4357
Activation of Charcoal. F. E. Bartell and L. E. Lloyd 4358

2. Surface Tension.

Disperse Gases. Part III. W. Luchsinger 26
Surface Tension of Aqueous Soap Solutions. F. A. Long, G. C. Nutting and W. D. Harkins 79
Surface Tension of Liquid Fluorine and Dielectric Constants of Liquid O_2, F_2, Cl_2 and HCl. E. Kanda 491
Speed of Spreading of Drops of Aqueous Solutions on Mercury. R. S. Burdon, G. R. Fuller and E. S. H. Gibson 492
Spreading with Uniform Acceleration. W. D. Allen, K. Grant and R. S. Burdon 493
Contact Angles and Wetting. E. Kneen and W. W. Benton 494
Liquid Drops on Liquid Surfaces. T. H. Hazelhurst and H. A. Neville 495
Atomic Forces of the Solid State. Part VII. Weng Wen-Po 499
Gaseous Solubility and Surface Tension. H. H. Uhlig 983
Surface Tensions of Alcohol-Water Mixtures. S. Valentiner and H. W. Hohls 992
Surface Tension. R. C. Brown 993
Diffraction of Light by Ripples on Liquid Surfaces. Part I. D. S. Subbaramaiya 1151
Surface Tension Constants of the Polyethylene Glycols and Their Derivatives A. F. Gallaugher and H. Hibbert 1488
Theory of Contact Angles. K. S. G. Doss and B. S. Rao 1861
Measurement of Small Surface Tensions. J. Guastalla 2301
Surface Tension of Liquid He. J. F. Allen and A. D. Misener 2302
Interfacial Tensions of Mercury-Hydrocarbon Oil Systems. Part II. J. L. Culbertson and K. D. Luedtke 2303
Calculation of Surface Tension from the Measurement of Sessile Drops. A. W. Porter 2304
Properties of Detergent Solutions. J. Powney and C. C. Addison 2305
Surface Tension of Aqueous Solutions. M. Dole 2734
Surface Tension of Fused Mixtures having Cryolite as Base. E. Elchardus .. 2735
Surface Tension Anomalies of Paraffin Chain Salts. N. K. Adam and H. L. Shute 2736
Surface Tensions of Liquid Crystals. A. Ferguson and S. J. Kennedy 3117
New Method of Measuring Surface Tension of Liquids. V. Naggiar 3551
Influence of Surface Tension on Viscosity Measurement. Viscosity of Methanol. G. Jones and H. J. Fornwalt 3566
Surface Tension by the Ring Method. D. G. Dervichian and C. Clark 3977
Effect of Temperature on Interfacial Tension between Castor Oil and Water. J. J. Trillat and P. Nardin 3978
Surface Tension of Vitreous Enamel Frits. W. N. Harrison and D. G. Moore 4359
Capillary Ascent in Cylindrical Tubes. A. W. Porter 4360
Measurement of Surface Tension and Density. E. Tyler 4820
Surface Tension and Internal Heat of Vaporisation. O. Albert and F. Eirich 4821
Lowering of Surface Tension of Water by Electrolytes. J. J. Bikerman 4822

3. Surface Structure.

Adsorption and Surface Structure. J. H. de Boer and J. F. H. Custers 80
Structures of Iron Films Deposited on Crystals of Alkali Halides. S. Shirai 81
Structural Investigation of Evaporated Metal Films. O. Rüdiger 82
Surface Structure of Liquid Mercury. G. L. J. Bailey, S. Fordham and J. T. Tyson 83
Colloidal Formations and Electrophoretic Phenomena on Metals. L. I. Beljajev 411
Oxide Films on Heated Iron. T. Iimori 1489
Structure and Optics of Evaporated Metal Films. G. Hass 1490

Surface Properties, *continued.*

Abstract Nos.

Structure of Surface Layers of Liquids and Films. S. E. Bresler and P. F. Pochil 1491
Electron Diffraction Study of Passivity of Iron. T. Iimori 1862
Surface Oxidation of Copper Single Crystals. T. Yamaguti 1863
Electron-Optical Observation of Metal Surfaces. Part III and IV. W. G. Burgers and J. J. A. P. van Amstel 1864
X-Ray and Optical Properties of Barium-Copper-Stearate Films. C. Holley 1866
Crystal Growth on Calcite Surfaces. G. I. Finch and E. J. Whitmore 2248
Oxidation of Aluminium Foils. K. Tanaka and H. Kano 2306
Oxidation of Metals. Part V. Oxidation of Molten Lead. L. L. Bircumshaw and G. D. Preston 2307
Polish on Metals. W. Cochrane 2308
Arrangement of Molecules in Single and Multiple Layers. L. H. Germer and K. H. Storks 2310
Structure of Electrolytic Deposits. P. Jacquet 2737
Passivity of Metals and Surface Compounds. L. Lepin 3118
Mechanism of Oxidation of Iron and Reduction of Iron Oxides. K. Endô 3119
Electron Diffraction by Oxides of Antimony Formed on Stibnite. S. Miyake 3120
Structure of Thin Ni and Ag Films. G. Menzer 3467
Optical Constants, Electrical Resistance and Structure of Thin Metal Films. J. Krautkrämer 3468
Fine Structure of Boundary Surfaces. T. Schoon 3552
Electron Diffraction Examination of Linear High Polymers. K. H. Storks 3886
Single Crystal Cleavage on Metal Surfaces in High Vacua. W. Kluge 3979
Structure of Polished Metal Surfaces. E. Plessing 3980
Monolayers of Isomeric Unsaturated Compounds. J. Marsden and E. K. Rideal 3982
Structure of Thin Layers Formed on Single Crystals. R. Uyeda 4361
Electron Diffraction and Surface Structure. G. I. Finch 4362
Structure of Electrolytically Polished Copper Surfaces. K. H. Moore 4363
Structure of Oxide Surface Films. A. Winkel and R. Haul 4364
Construction of Filament Surfaces. R. P. Johnson 4365
Temperature Variation of Electron Diffraction Patterns of Organic Films. K. Tanaka 4367
Low-Temperature Oxidation of Iron. H. R. Nelson 4823

4. Parachors.

Parachor of NO_3F. D. G. Hill and L. A. Bigelow 84
Theoretical Calculation of Parachors. R. H. Fowler 994
Extension of the Macleod Equation. D. T. Lewis 1492
Thermodynamic Properties of the Hexyl Alcohols. F. Hovorka, H. P. Lankelma and S. C. Stanford 2519
Theoretical Deduction of Latent Heat of Fusion. N. S. Binayendra 3318
Relationships between Parachor Values and the Physical Constants of Homologous Series. D. T. Lewis 3553
Molecular Volumes and Parachors of Mercuric Halides and their Group Relationships. E. B. R. Prideaux and J. R. Jarratt 3981
Physical Properties of Cyclo-Pentane, -Hexane and -Heptane and Derivatives. A. I. Vogel 4366

5. Films (*see also* Surface Structure).

Monomolecular Layers. D. G. Dervichian 85
Effect of Dissolved Salts on Insoluble Monolayers. I. Langmuir and V. J. Schaefer 86
Flow on Monomolecular Films. M. Joly 496
Copper Oxide Films. H. A. Miley 497
Monomolecular Films on Mercury. H. Devaux 995
Homogeneous Transformations in Monomolecular Films. D. G. Dervichian and M. Joly 996
Electrical Behaviour of Thin Metallic Films Condensed at Low Temperatures. H. R. Mitchell 1288
Mechanical Properties of Adsorption Layers. A. A. Trapeznikov and P. Rehbinder 1493

For the **Key** to this Index see pp. 1182 to 1194.

Surface Properties, *continued.*

Abstract Nos.

Ellipticity of Light Reflected from Thin Films of Oriented Molecules. H. A. McTaggart 1621
Transformation Temperatures of a Metallic Film. Part II. T. Fukuroi .. 1865
Automatic Dipping Mechanism for Making Built-Up Films. R. W. Mattoon and S. Bernstein 1867
Spreading of Substances on Water. Part I. L. A. Ramdas and P. S. Vaidyanathan 2309
Unit of Foaminess. J. J. Bikerman 2311
Electrical Properties of Metal Films. E. Perucca 2564
Electrical Conductivity of Thin Metallic Films. Part III. Alkali Films with Properties of Normal Metal. A. C. B. Lovell 2565
Molecular Interaction in Monolayers. J. Marsden and J. H. Schulman 2738
Overturning and Anchoring of Monolayers. I. Langmuir........ 2739
Flow of Unimolecular Surface Films. E. R. Washburn and H. R. R. Wakeham 3121
Viscosity of Unimolecular Films. W. J. Moore, Jr., and H. Eyring 3122
Large-Scale Representation of Monomolecular Films. H. Devaux and L. Pallu 3554
Monomolecular Layers. R. Brill. 3555
Mechanical Properties of Films and Stability of Foams. P. A. Rehbinder and A. A. Trapeznikov 3556
Stabilising Effect of Adsorption Layers and Their Mechanical Properties. A. A. Trapeznikov and P. A. Rehbinder 3557
Nature of Foam. Part I. T. Sasaki 4368
Stretching of Heated Polystyrene Films. G. van Iterson, Jr., and K. E. C. Buyn 4747
Boundary Layer at Membrane and Monolayer Interfaces. J. H. Schulman and T. Teorell 4774
Flow and Viscosity of Monomolecular Films. M. Joly 4824
Surface Viscosity of Long-Chain Alcohol Monolayers. L. Fourt and W. D. Harkins 4825

6. Cohesion and Adhesion.

Van der Waals Forces. A. J. Staverman 259
Anisotropy of van der Waals Forces. J. H. de Boer and G. Heller 405
Cohesive Forces of Liquids. A. T. van Urk 498
Atomic Forces of the Solid State. Part VII Weng Wen-Po 499
Energies of Adhesion and the Effectiveness of "Collectors" used in Froth Flotation. S. Valentiner 2312
Theory of Liquids. A. Ganguli 2684
Improved Calculation of the Energies of Metallic Li and Na. J. Bardeen 3068
Compressibilities of Alkali Metals. J. Bardeen 3069

7. Lubrication.

Lubrication of Taps with Phosphoric Acids. D. L. Chapman and L. A. Moignard 500
Molecular Forces in Friction and Boundary Lubrication. N. K. Adam 1868
Adsorption of Oils in Relation to Lubrication. J. J. Trillat 1869
Oiliness in Relation to Viscosity . A. W. Burwell and J. A. Camelford 1870
Problem of "Oiliness." S. Kyropoulos 1871
Oiliness of Liquids. Part V. H. Akamatu. Part VI. T. Sasaki 1872
Increase in Viscosity of Mineral Oil at Rest. A. Marcelin 4826

8. Electrical Phenomena at Interfaces.

Surface Phenomena and Dissociation Constant of Weak Electrolytes. B. Kamieński 87
Dielectric Potential and Surface Tension. B. Kamieński 88
Explanation of the Coehn-Raydt Law of Charge. A. J. Rutgers 875
Flow Potentials, Electro-Endosmosis and Electrophoresis with Platinum. H. R. Kruyt and J. Oosterman 2661
Surface Electrification Due to the Recession of Aqueous Solutions from Hydrophobic Surfaces. I. Langmuir 2740
Measurement of Superficial Electric Moments in the Midst of a Liquid. N. Choucroun and M. Arditi 2741

For the **Key** to this Index see pp. 1182 to 1194.

Surface Properties, *continued.*

Abstract Nos.

Resistance and Capacity of Monofilms of Barium Stearate. C. E. Buchwald, D. M. Gallagher, C. P. Haskins, E. M. Thatcher and P. A. Zahl 2742
Contact Potentials of Stearate Films on Metal Surfaces. E. F. Porter and J. Wyman, Jr. 2743
Surface pH. S. R. Craxford, O. Gatty and T. Teorell 2744
Theory of Electrocapillarity. Part VII. Surface Films. S. R. Craxford, O. Gatty and T. Teorell 2745
Motion of a Mercury Index in a Capillary Tube. G. D. Yarnold 2746
Electrochemistry of the Rusting Process along a Scratch-Line on Iron. R. S. Thornhill and U. R. Evans 2992
Electric Moment of Aliphatic Alcohols, Acids, and Esters at Cellulose and Aluminium Oxide Interfaces. M. A. Lauffer and R. A. Gortner 3123
Potentials of Built-Up Multilayers on Metals. J. J. Bikerman 3124
Adsorption at the Mercury Drop Electrode and the Polarographic Current-Voltage Curves. A. Winkel and H. Siebert 3379
Electrokinetic Properties of Activated Charcoal. H. L. Bennister and A. King 3452
Mercury-Solution Boundary Layers of Organic Substances. A. Gorodezkaya and A. Frumkin 3558
Normal Volta Potentials $\Delta\psi_0$ of Two-Phase Systems. O. Klein and E. Lange 3829
Electrochemical Interpretation of Wagner's Theory of Tarnishing Reactions. T. P. Hoar and L. E. Price 3830
Flow Phenomena at Mercury Kathodes. M. v. Stackelberg, H. J. Antweiler and L. Kieselbach. 4222
Electron Movements at Exterior Boundary Surfaces. R. Suhrmann 4264
Properties of Thin Sheets of Noble Metals in Contact with Gases. M. Auwärter and K. Ruthardt. 4369
Carrier Mobility Spectra of Liquids Electrified by Bubbling and Spraying. S. Chapman. 4827
Equivalent Circuit of Conductivity Cells. S. F. Acree, E. Bennett, G. H. Gray and H. Goldberg 5036
Capacity of Mercury Electrode in Solutions of Capillary-Active Organic Substances. A. Ksenofontov, M. Proskurnin and A. Gorodetzkaja 5047
Capacity of the Solid Mercury Electrode. A. Gorodetzkaja and M. Proskurnin 5048

10. Unclassified.

Decay of Circular Waves on Water. J. Baurand 1821
Free Discharge of Liquids from Capillary Tubes. A. Grumbach 1873
Dynamics of Certain Liquid Movements in Capillary Systems (Lloyd Effect). Wo. Ostwald and H. Erbring 2252
Equilibrium of Membranes. H. Pailloux 2692
Investigation of Surface Phenomena by Radioactive Methods. O. Hahn 3559
Reflection Coefficient of Mercury. R. C. Mason 3697
Engine for Smoothing Small Tungsten Wires. R. P. Johnson, A. B. White and R. B. Nelson 4268
Spreading of Liquids in Filter Paper. Part II. K. Prosad and B. N. Ghosh 4371

Electrolytic Polishing of Aluminium. P. Jacquet 350B
Corrosion of Iron at the Boundary Metal-Liquid-Gas and Metal-Liquid-Liquid. M. K. Tikhonov 689B
Lubrication. M. Muskat and F. Morgan. 2576B, 2577B
Transfer of Pressure on Lubricated Cylindrical Surfaces. W. Peppler 2856B

Temperature.

1. Scales and Standard Temperatures.
2. Temperature Measurement and Control.
3. Low Temperature Research.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
Flame, Ignition, Explosion Temperatures, *see* Thermochemistry.

Cross-References (contd.) :
Liquefaction of Gases, *see* Vaporisation and Condensation.
Temperature of Earth, Air, Sea, *see* Land, Physics of the; Meteorology; Hydrosphere, Physics of the.

1. Scales and Standard Temperatures.

Temperature Scale below 1°K. W. Jacyna 250
Gas-Thermometric Data Differences. W. Jacyna 251

For the **Key** to this Index see pp. 1182 to 1194.

Temperature, *continued.*

Abstract Nos.

Reproducibility of the Ice Point and the Triple Point of Water. J. A. Beattie, Tzu-Ching Huang and M. Benedict 2075
Thermodynamic Temperature Scale below 1°K. W. F. Giauque and D. P. MacDougall 2078
Transition Temperature of $Na_2SO_4, 7H_2O$. E. R. Washburn and W. J. Clem 2505
Ice-Point as Standard of Reference. E. E. Roper 2506
Thermodynamic Scale below 1°K. W. Jacyna, L. Malis and A. Obnorsky .. 2932
Establishment of Scale of Colour Temperature. H. Djoudat 3306
Temperature Scale and Thermionic Emission from Rhodium. H. B. Wahlin and L. V. Whitney 4582

2. Temperature Measurement and Control.

Melting Point of Silicon. F. Hoffmann and A. Schulze 247
Improvement in Flame Temperature Measurements. G. Ribaud 767
Potential of the Normal and the Decinormal Calomel Electrodes. H. T. S. Britton and G. Welford 845
Potentiometer Method for Determining Time-Temperature Curves. C. Perrier and A. Bellanca 1242
Heat. R. W. Powell 1243
Thermoregulator for Experiments of Long Duration. N. Sălăgeanu 2076
Reutter's Heat Engine. H. Bock 2077
Thermo-Electrolytic Temperature Measurements. S. Zamenhof 2933
Temperature of Incandescent Kathodes by Electron Current Measurement. W. Heinze and W. Hass 3307
Freezing Point of Methanol; Simple Cryostat. E. E. Roper 3767
Wall Temperature and Dwelling Comfort. H. Roose 3768
Electrolytic Resistors for D.C. Applications in Measuring Temperatures. D. N. Craig 3769
Sensitive Method of Temperature and Pressure Measurement. S. Zamenhof 3770
Photoelectric Contact-Making Galvanometer. W. L. Carson 3878
Temperature Measurement by the Method of Reversed Lines. H. J. Hübner. 4583
Thyratron-Controlled Thermostat. J. M. Sturtevant 4584

3. Low Temperature Research.

Measurements of Liquid Helium Temperatures. Parts I and II. G. Schmidt and W. H. Keesom 252
Calorimetric Measurements on Refrigerants. A. Perlick 758
Thermal Conductivity of Diamond and Potassium Chloride. W. J. de Haas and T. Biermasz 760
Freezing Point Apparatus. D. Quiggle, C. O. Tongberg and E. M. Fry...... 766
Vaporisation of SO_2 with Delayed Boiling and Bubble Formation. E. Haidlen 790
Refrigeration. E. Griffiths 1244
Adiabatic Demagnetisation of Caesium Titanium Alum. J. H. van Vleck .. 1333
Adsorption of He on Charcoal below 78°K., and Production and Thermometry of Low Temperatures. E. Kanda 1856
Heat of Adsorption of He Gas near 1°K. J. W. Stout and W. F. Giauque .. 1857
Thermal Conductivity of Crystals at Low Temperatures. W. J. de Haas and T. Biermasz 2071
Thermodynamic Temperature Scale below 1°K. W. F. Giauque and D. P. MacDougall 2078
Induction Heaters for Calorimetry below 1°K. W. F. Giauque and J. W. Stout 2079
Thermal Equilibrium at Temperatures Below 1° Abs. E. S. Shire and J. F. Allen 2507
Low-Temperature Researches. J. D. Cockcroft 2934
Cooling by Adiabatic Demagnetisation. P. Debye.......... 2935
Phosphor-Bronze Resistance Thermometers for the Temperature Region of Liquid Helium, Suitable for Use in Strong Magnetic Fields. P. H. van Laer and W. H. Keesom 2936
Amorphous Carbon Resistance-Thermometer Heaters at Low Temperatures. W. F. Giauque, J. W. Stout and C. W. Clark 2937
Simple Type of Helium Cryostat. J. G. Daunt and K. Mendelssohn 2938
Thermal Data of Solid and Liquid SO_2. W. F. Giauque and C. C. Stephenson 3294

For the **Key** to this Index see pp. 1182 to 1194.

Temperature, *continued.*

Abstract Nos.

Phosphorbronze Resistance Thermometers for Temperatures below 1°K., and Carbon and Ink Thermometers for Use in High Magnetic Fields between 1 and 4°K. H. van Dijk, W. H. Keesom and J. P. Steller 3308
Dependence on Thickness of the Thermal Resistance of Crystals at Low Temperatures. W. J. de Haas and T. Biermasz 3762
Production and Measurement of Low Temperatures. K. R. Dixit 3771
Paramagnetic Relaxation in Iron Ammonium Alum at Low Temperatures. W. J. de Haas and F. K. du Pré 3854
Thermodynamic Interpretation of Paramagnetic Relaxation Phenomena. H. B. G. Casimir and F. K. du Pré 3855
Attainment of Low Temperatures. C. G. Darwin 4166
Gas Thermometer for Very Low Temperatures. A. H. Woodcock 4167
Phenomena at the Temperature of Liquid Helium. E. F. Burton 4168
Peculiarities in Liquefaction of Helium. I. L. Zelmanov 4177
Properties of Gaseous He at Liquid He Temperatures. A. van Itterbeek .. 4585
Low-Temperature Heat Capacity Measurements on BF$_3$, CF$_4$ and SF$_6$. A. Eucken and E. Schröder 4980

5. Unclassified.

Temperature Determinations from Band Spectral Data. H. P. Knauss and M. S. McCay 218
Calculation of Temperatures and Pressures of Combustion in a Closed Vessel. G. Ribaud 785
Correlation of Colour Temperatures Based on the Wien and Planck Formulæ. R. S. Estey 4071

Electric Resistance Thermometers. H. Lindorf 83B
Lag in Thermometers. F. Lieneweg 404B
Resistance Thermometers of Heat-Resistant Semiconductors. H. Grüss .. 778B

Terrestrial Electricity and Magnetism.

1. Atmospheric Electricity. Ionosphere.
2. Earth's Magnetic Field.
3. Earth Currents.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.
Cross-References:
Aurora, *see* Meteorology.
Cross-References (*contd.*)*:*
Cosmic Rays, *see* Emission (Radiation).
Electric Wave Propagation in Ionosphere, *see* Oscillations and Waves, Electric.
Magnetism of Rocks, *see* Geophysics, Applied; *also* Land, Physics of the.

1. Atmospheric Electricity. Ionosphere.

Air Potentials. K. L. Sherman 128
Ionisation Produced by the Evaporation of Water. E. Medi 129
Dissociation, Recombination and Attachment Processes in the Upper Atmosphere. Part I. H. S. W. Massey 130
Lightning Discharges in the Upper Atmosphere. D. Malan 131
Progressive Lightning. Part IV. Discharge Mechanism. B. F. J. Schonland 132
Electric Charges on Single Raindrops and Snowflakes. J. A. Chalmers and F. Pasquill 133
Atmospheric Electric Field and Air Mass Conditions. H. Arakawa 576
Atmospheric Electricity at the College-Fairbanks Polar Year Station. K. L. Sherman 577
World-Wide Changes in Potential Gradient. G. R. Wait and J. W. Mauchly .. 578
Continuous Registration of Specific Number of Ions in the Atmosphere. H. Greinacher and W. Klein 579
Air-Earth Current, Visibility, Relative Humidity and Mass-Exchange. H. Grieger 580
Heating of the Ionosphere by Electric Currents Associated with Geomagnetic Variations. S. Chapman 586
Heating of the Earth and Oceans by Induced Electric Currents. S. Chapman 587
Exploration of Electric Fields in Clouds. F. J. W. Whipple 1103
Distribution of Electricity in Thunderclouds. B. Walter 1104
Point-Discharge Currents during Thunderstorms. M. N. S. Immelman 1105
Recording of Atmospherics and the Forecasting of Storms. R. Faillettaz 1106

Terrestrial Electricity and Magnetism, *continued.*

Abstract Nos.

Observations in Highest Stratosphere Flight 1545

Photographic Study of Lightning. R. E. Holzer, E. J. Workman and L. B. Snoddy 1563

Photoelectric Ionisation in the Ionosphere. E. O. Hulburt 1564

Ionisation Balance and Amount of Radium Emanation in the Atmosphere. J. Clay and L. J. L. Dey 1565

Space Charge in the Atmosphere. Part II. C. W. Lutz 1944

Polar Molecules and Radio Waves. M. C. Holmes 2190

Ionisation, Negative-Ion Formation, and Recombination in the Ionosphere. N. E. Bradbury 2193

Solar Radiation and the Electric Charge of the Earth. G. Petrucci 2379

Solar Radiation and the Terrestrial Electric Field. G. Petrucci 2380

Modern Views on Atmospheric Electricity. F. J. W. Whipple 2381

Thunderstorm Rain and Earth's Negative Charge. S. K. Banerji 2382

Progressive Lightning. Part V. B. F. J. Schonland, D. B. Hodges and H. Collens 2383

Parabolic Relations between Flow of Electricity in Regions of Low Atmospheric Pressure and Ionisation by γ-Rays. H. Mache and O. Moszkowicz 2809

Electricity on Rain. F. J. Scrase 2810

Molecular Dissociation in the Upper Atmosphere. R. C. Majumdar 2811

Centres of Thunderstorms and "Centres" of Sources of Atmospherics. R. Bureau 2812

Variation of Electrical Conductivity of the Atmosphere with Height. D. C. Rose 3628

Mechanism of Thundery Conditions at Karachi. S. Mal and B. N. Desai 3629

Phase Irregularities of the Diurnal Component of the Earth's Electric Field. R. Guizonnier 4051

Motion of an Electrified Corpuscle in Presence of a Magnetic Dipole. C. Agostinelli 4224

Diurnal Variation of Atmospheric Condensation-Nuclei. N. E. Bradbury and H. J. Meuron 4430

Electrical Field and Radiation of the Atmosphere. E. Medi 4441

Electrical Charge Distribution in Thunderclouds. A. K. Dutta 4442

Production of Condensation Nuclei in the Presence of Electrical Charges. G. Tohmfor and M. Volmer 5003

2. Earth's Magnetic Field.

Survey of Facts and Theories of the Auroræ. E. W. Hewson 123

Astrophysical Problems of the Ionosphere. N. E. Bradbury, A. G. McNish, J. H. Dellinger, R. S. Richardson 371

Dissemination of Magnetic Data of American-Operated Magnetic Observatories. E. O. Hulbert, S. S. Kirby, A. K. Ludy and A. G. McNish 581

New Approach to Study of Terrestrial Solar Relationships. J. W. Mauchly 582

Regular Progressive Changes of the Magnetic Field of Diurnal Variations of Terrestrial Magnetism. Part I. M. Hasegawa and Y. Tamura 583

Determination of Magnetic Inclination with an Earth-Inductor. J. Egedal 584

Heating of the Ionosphere by Electric Currents Associated with Geomagnetic Variations. S. Chapman 586

Heating of the Earth and Oceans by Induced Electric Currents. S. Chapman 587

Deep-Focus Earthquakes and Anomalies of Terrestrial Magnetism and Gravity. S. W. Visser 1096

Demagnetising Action of Changes in Earth's Magnetic Field. H. Schmidlin 1107

Magnetic Storm and Variation of Cosmic Rays. J. Clay and E. M. Bruins 1145

Magnetic Survey of the Oceans. J. A. Fleming 1566

Regular Progressive Changes of the Magnetic Field of Diurnal Variations of Terrestrial Magnetism. Part II. M. Hasegawa and Y. Tamura 1945

Physical Causes of Earth's Magnetism. H. Haalck 1946

Cosmic Radiation and Magnetic Storm of Jan., 1938. W. Kolhörster 1984

Variations of Cosmic Radiation during Magnetic Storms. T. H. Johnson 1985

Terrestrial Magnetism, and Cosmic-Ray Intensity. V. F. Hess, A. Demmelmair and R. Steinmaurer 1986

Work of Drifting North Polar Station. P. Shirshov and E. Fedorov 2352

American Magnetic Character-Figure C_A for 1937. A. G. McNish and H. F. Johnston 2384

Magnetic Storm and Variation of Cosmic Rays. J. Clay and E. M. Bruins 2419

For the **Key** to this Index see pp. 1182 to 1194.

Terrestrial Electricity and Magnetism, *continued*.

Abstract Nos.

Height of Electric Currents near the Auroral Zone. A. G. McNish 2813
Theories of Magnetic Storms and Auroræ. S. Chapman 2814
Interpretation of Terrestrial and Solar Magnetic Fields. J. Mariani 2815
Magnetic Storm of 16th April, 1938. J. Bartels and G. Fanselau 2816
Natural Residual Magnetism of Eruptive Rocks. Part I. J. G. Koenigsberger 3168
Terrestrial Magnetism and Oceanic Structure. J. A. Fleming 3185
Terrestrial Magnetism and Chromospheric Eruptions. J. Coulomb and G. Dugast 3186
Terrestrial Magnetic Activity. J. Bartels 3187
Comparison of Coil-Magnetometer and Earth-Inductor. W. M. H. Greaves and W. M. Witchell 3188
Temperature-Compensation of the Unifilar by Means of Thermalloy. B. M. Janowsky 3189
Effect of Torsion in Quartz Horizontal-Intensity Magnetometer Observations. H. H. Howe 3190
Magnetic Anomalies Around Volcanic Craters. T. Nagata 3630
Magnetic Anomalies and Subterranean Structure. T. Nagata 4022
Earth's Magnetic Field and Cosmic Radiation. V. F. Hess, A. Demmelmair and R. Steinmaurer 4080
Natural Residual Magnetism of Eruptive Rocks. Part II. J. G. Koenigsberger 4425
Changes in Earth's Magnetic Field Accompanying Earthquakes or Volcanic Eruptions. Y. Katô 4443
Asymmetrical Characteristics of the Earth's Magnetic Disturbance-Field. E. H. Vestine 4444
Cosmic-Ray Effects Associated with Magnetic Storms. S. E. Forbush 4477
Magnetic Anomalies and Subterranean Mass Distribution. T. Nagata 4853
Polar Aurora and Night-Sky Light. H. H. Plaskett 4865
Diurnal Variation of the Magnetic Pole. K. F. Wasserfall 4879
Radiation of the Earth's Angular Momentum. T. Schlomka 4880

3. Earth Currents.

Earth's Interior as Inferred from Terrestrial Magnetism. A. G. McNish 549
Lunar Effect on Earth Currents. P. Rougerie 585
Heating of the Ionosphere by Electric Currents Associated with Geomagnetic Variations. S. Chapman 586
Heating of the Earth and Oceans by Induced Electric Currents. S. Chapman 587
Field Strength and Current Density of a Dipole in the Earth's Surface. G. de Niem 1108
Effect of Temperature on the Electrical Constants of Soil at Radio Frequencies. R. D. Joshi 2791
Earth Currents and Magnetic Perturbations. J. Bosler 2817
Reality of the Seismic-Electric Effect. S. v. Thyssen, J. N. Hummel and O. Rülke 3180
Seismic Electric Effects and their Possible Employment in Seismometry. A. Belluigi 3181
Lunar Diurnal Variation in Earth-Currents at Huancayo and Tucson. W. J. Rooney 3191

5. Unclassified.

Summary of the Year's Work, Department of Terrestrial Magnetism, Carnegie Institution of Washington. J. A. Fleming 1110
Stationary Air Currents in Closed Vessels. H. Benndorf and M. Mitlacher 2818

Thermionics.

1. Theory.
2. Measurement of Work Function and Other Emission Constants.
3. Effect of Surface Layers.
4. Effect of Intense Fields (Auto-Electronic Effect).
5. Emission of Positive Ions.
6. Apparatus, *see* Supplementary Index.
7. Unclassified.

Cross-References:
Secondary Electronic Emission, *see* Electrons, etc.
Valves, *see also* Oscillations and Waves, Electric.

For the **Key** to this Index see pp. 1182 to 1194.

Thermionics, *continued*.

1. Theory.

Abstract Nos.

Shot Effect of Secondary Electrons from Nickel and Beryllium. B. Kurrelmeyer and L. J. Hayner 382
Influence of Space Charge on a Current in a Vacuum. S. Bellustin 383
Influence of Crystal Lattice on Thermionic Emission. B. Mrowka 1360
Theory of Thermionic Emission. W. Schottky 1361
Background Noises and Valve Amplifiers. M. Mandô 3426
"Three-Halves Power" Law of Thermionic Emission. E. L. E. Wheatcroft 3427
Fluctuations and the Shot Effect. E. N. Rowland 3520
Energy Exchanges at Boundary Surfaces. H. J. de Boer 3760
Electron Movements at Exterior Boundary Surfaces. R. Suhrmann 4264

2. Measurement of Work Function and other Emission Constants.

Temperature Variation of the Work Function of Clean and of Thoriated Tungsten. A. L. Reimann 384
Influence of External Field on the Electron Emission Constants of Ba-Coated Platinum Surfaces. R. Suhrmann and L. J. v. Eichborn 385
Characteristic of Thermionic Emission of Thoriated Molybdenum. P. Grauwin 1362
Effect of Electron Bombardment on the Field Emission of Layered Kathodes. H. Mahl 1363
Photoelectric and Thermionic Investigations of Thoriated Tungsten Surfaces. A. King 2198
Thermionic Emission from Carbon. A. L. Reimann 3039
Emission of Protons from Hydrogenated Palladium. T. Franzini 3428
Work of Removal of Electrons from Metals. O. Klein and E. Lange 4265
Contact Potential and Exit-Work. W. Heinze 4266
Thermionic Emission of Pt in H_2 and O_2. S. Kalandyk 4730
Change of Electron Exit Work on Activation of Oxide Kathodes. W. Heinze and S. Wagener 4732
Secondary Electron Emission from Wire Gauze. M. Sandhagen 5057

3. Effect of Surface Layers.

Electron Microscope for Studying Thermal and Secondary Electron Emission. E. Meschter 871
Rates of Deposition of Oxygen upon Tungsten. M. C. Johnston and A. F. Henson 1364
Oxide-Coated Kathodes. Part I. Particle-Size and Thermionic Emission M. Benjamin, R. J. Huck and R. O. Jenkins 2199
Further Observation with the Field Electron Microscope. E. W. Müller 3429
Field Emission of Electrons at Thin Films of Insulating Material of the Type $Al\text{-}Al_2O_3\text{-}Cs_2O$. J. Mühlenpfordt 3430
Electron-Optical Examination of Electronic and Ionic Emission from Wires. H. Mahl 3880
Influence of Adsorption Layers upon the Impact of Positive Caesium Ions in Tungsten. H. Paetow and W. Walcher 4267
Temperature Scale and Thermionic Emission from Rhodium. H. B. Wahlin and L. V. Whitney 4582
Electron Microscope Study of Thoriated Tungsten. A. J. Ahearn and J. A. Becker 4731
Secondary Electron Emission of Beryllium. R. Kollath 5056

5. Emission of Positive Ions.

Evidence for Halogen Films on Tungsten in the Surface Ionisation of Potassium Halides. J. O. Hendricks, T. E. Phipps and M. J. Copley 386
Thermionic Emission of Positive Ions from Molybdenum. H. Grover 387
Positive Ion Emission from Heated Nickel Wire in Oxygen and Hydrogen. R. Goto 898
Evaporation of Atoms, Ions and Electrons from Tungsten. A. L. Reimann 3431

7. Unclassified.

Temperature of Incandescent Kathodes by Electron Current Measurement. W. Heinze and W. Hass 3307

For the **Key** to this Index see pp. 1182 to 1194.

Thermionics, *continued.*

Abstract Nos.
Engine for Smoothing Small Tungsten Wires. R. P. Johnson, A. B. White and R. B. Nelson 4268
Construction of Filament Surfaces. R. P. Johnson 4365

Thermionic Trigger. O. H. Schmitt 390B

Thermochemistry.

1. Heats of Solution and Dilution.
2. Heat of Combustion.
3. Heats of Formation and Dissociation.
4. Flames, Ignition, Explosion.
5. Effect of Temperature on Chemical Processes and Equilibria.
6. Apparatus, *see* Supplementary Index.
7. Unclassified.

Cross-References :
Heat of Adsorption, *see* Surface Properties.
Thermodynamics of Chemical Processes, *see* Thermodynamics.

1. Heats of Solution and Dilution.

Heat of Sorption of Solvents by Nitrocellulose. Part II. S. Papkov and V. Kargin 490
Thermochemistry of Perchloric Acid and the Perchlorates. C. F. Goodeve and A. E. L. Marsh 769
Osmotic Pressure, Heat and Entropy of Dilution in the Systems Nitrocellulose-Cyclohexanone and Nitrocellulose-Acetone. C. G. Boissonnas and K. H. Meyer 2691
Heats of Hydration and Transition of Calcium Sulphate. E. S. Newman and L. S. Wells 2939
Lattice Disturbances, Particle Size and Thermal Content of Pyrophoric Iron R. Fricke, O. Lohrmann and W. Wolf 2940
Ions in Solution. H. S. Harned 3103
Heats of Dilution and Heat Contents of Aqueous $CdSO_4$ Solutions. T. H. Dunkelberger and A. L. Robinson 3309
Heats of Mixture of Ternary Mixtures. V. Fischer 3310
Heat of Solution of Anhydrous $AlCl_3$. W. A. Roth and E. Börger 3772
Heats of Solution of Calcium and Magnesium Oxides and Hydroxides. K. Taylor and L. S. Wells 3773
Variation of Osmotic Pressure, Heat of Dilution and Dilution Entropy of High-Molecular Solutions with Temperature. G. V. Schulz 3921
Isotopic Effects in Heats of Dilution of Electrolyte Solutions and of Water-Dioxane-Mixtures. W. Birnthaler and E. Lange 4169
Solution of Ions in Water. D. D. Eley and M. G. Evans 4595
Heat Contents of Salts of Alkali Metal in Extemely Dilute Aqueous Solutions. T. F. Young and P. Seligmann 4986

2. Heat of Combustion.

Combustion Levels in Flame Gases. W. T. David 255
Heats of Combustion and Inner Molecular Arrangement. H. Dunken and K. L. Wolf 1676
Heat Combustion of Isoprene. R. S. Jessup 2508
Experimental Investigation of Combustion Calorimeters. S. W. Lipin 2926
Calculation of Calorific Powers of Hydrocarbons. M. Brutzcus 2941
Heats of Combustion of Hippuric and Succinic Acids. H. M. Huffman 2942
Heat of Combustion of Styrols. W. v. Luschinsky 4586
Heats of Combustion of Anthracite Cokes and of Artificial and Natural Graphites. P. H. Dewey and D. R. Harper 4987
Heats of Combustion of Diamond and of Graphite. R. S. Jessup 4988

3. Heats of Formation and Dissociation.

Heats of Ionisation of Water, Ammonium Hydroxide, Carbonic, Phosphoric and Sulphuric Acids. Variation of Ionisation Constants with Temperature and the Entropy Change with Ionisation. K. S. Pitzer 256
Vapour Pressure and Dissociation of Tungsten Hexachloride in the Gas Phase. A. A. Vernon 269
Energetical Interpretation of the Semipolar Double Bond. R. Samuel 401
Dissociation Energy of the CN Molecule. R. Schmid, L. Gerö and J. Zemplén 1649
Heat of Formation and Specific Heat of Aluminium Carbide. S. Satoh 1677

Thermochemistry, *continued.*

Abstract Nos.
Heat of Formation and Specific Heat of Silicon Nitride. S. Satoh 1678
Heat of Formation and Specific Heat of Vanadium Nitride. S. Satoh 1679
Thermochemistry of Sulphur Compounds. M. Brutzcus 2080
Structural Formulae of Unsaturated Hydrocarbons. M. Brutzcus. 2210
Stability of Free Radicals. C. E. H. Bawn 2212
Heat Content of Colloidal Gold. R. Fricke and F. R. Meyer 2232
Lattice Energies of Alkali Iodides and the Electron Affinity of Iodine. A. N. Tandon 2233
Heat of Formation and Specific Heat of Tantalum Nitride. S. Satoh 2943
Calcium Subfluoride. K. H. Hellwege 2944
Heat of Formation and Specific Heat of Calcium Nitride. S. Satoh 3311
Atomic Heat of Nitrogen in Nitrides. Part I. S. Satoh 3774
Heat of Formation and Specific Heat of Chromium Nitride. S. Satoh 4587
Heat and Free Energy of Formation of CO_2 and of the Transition between Graphite and Diamond. F. D. Rossini and R. S. Jessup 4989

4. Flames, Ignition, Explosion.

Dynamics of Compressible Fluids at Supersonic Velocities. C. Ferrari 52
Piezoelectric Measurements in Ballistics. H. Illgen 474
New Method of Obtaining the Spectra of Metals. H. Muraour and A. Michel-Lévy 735
Improvements in Flame Temperature Measurements. G. Ribaud 767
Flame Velocities. Part I. Theroretical Calculation. W. Jost and L. v. Müffling 770
Explosive Limits of Gaseous Mixtures. R. Bresquer, M. Rivin and A. Sokolik 771
Explosion Waves and Shock Waves. Part V. Shock Wave and Explosion Products from Detonating Solid Explosives. W. Payman and D. W. Woodhead 772
Limits of Detonation of Mixtures of Hydrocarbons and Air. M. Rivin and A. Sokolik 1246
Ignition of NH_3 and N_2-H_2. N. W. Tokarew and N. I. Nekrassow 1247
Spontaneous Ignition under Pressure of Typical Knocking and Non-Knocking Fuels. M. Maccormac and D. T. A. Townend 1680
Recombination of OH Radicals in the Electric Discharge. V. Kondratjew. 2554
Influence of Moisture on the Intensity of the Visible Radiation of the Flame of CO and O_2. H. Kondratjewa and V. Kondratjew 2945
Flame Propagation in the System Dinitrogen Pentoxide-Ozone. T. M. Lowry and R. V. Seddon 2946
Effect of Solid Admixtures on Velocity of Propagation of Flame in Combustible Gas Mixtures. S. Gribkova and A. Predwoditelev 2947
Metallic Explosion Spectra. A. Michel-Levy and H. Muraour 3241
Speed of Propagation of Flames in Air-Propane and Air-Coal-Gas Mixtures. G. Ribaud and H. Gaudry 3312
Explosive Decomposition of Acetylene Accompanied by Flame. A. Gross 3313
Law of Combustion. H. Muraour and G. Aunis 3314
Two-Stage Auto-Ignition of Hydrocarbons and "Knock." G. P. Kane...... 3315
Flight of Projectile. R. H. Kent 3524
Temperature Distribution in Reaction Vessel and Stationary Theory of Thermal Explosions. D. A. Frank-Kameneckij 3765
Detonation in Explosives by Thermal Impulse. A. F. Belajev 3775
Two-Stage Spontaneous Ignition of Hydrocarbons. A. V. Belov and M. B. Neumann 3776
Explosion Potential in Benzene. E. Badareu and L. Constantinesco 3798
Indetermination of the Intervals and Origin of Explosion Waves. G. Wataghin 4170
Explosive Potential in Benzene. E. Badereu 4192
Distribution of Mass, Velocity, Momentum and Energy of Broken Pieces of Exploded Bodies. Part III. S. Suzuki and H. Nagasima 4342
Generalisation of Relativity Transformations. G. Wataghin................ 4349
Theory of Uniform Flame Propagation. J. B. Zeldovich and D. A. Frank-Kameneckij 4588
Thermal Explosion of N_2O. J. B. Zeldovich and B. I. Jacovlev 4589
Combustion of Explosives. A. F. Belajev................................ 4590
Hydrodynamical Theory of Detonation. H. Langweiler.................. 4591
Fundamental Oscillations in Burning Gas Mixtures. G. Guderley............ 4990

Thermochemistry, *continued.*

Abstract Nos.
Special Solutions for the Motion of Powder Gas. R. H. Kent 4991
Explosive Processes. W. Jost and L. v. Müffling. 4992

5. Effect of Temperature on Chemical Processes and Equilibria.

Oxidation of Carbon. S. E. Khaikina 2509

7. Unclassified.

Chemical Inertia. P. Renaud 773
Thermal Properties of Heavy Hydrogen. K. Clusius 774
Thermal Properties of Heavy Water. E. Lange 775
Calculation of Constants of Sr and Ba. P. Gombás and G. Péter 1394
Heats of Sublimation. K. L. Wolf and H. Weghofer 2510

Dust Explosions. W. Gliwitzky 3483B

Thermodynamics.

1. Fundamental Principles (1st and 2nd Laws). Mechanical Equivalent of Heat.
2. Equations of State and Critical Phenomena. (Theoretical and Experimental)
3. Applications to Specific Heats and Latent Heats.
4. Phase Rule and Applications.
5. Measurements of and Formulae for Entropy, Internal Energy, Total Heat (Enthalpy), Free Energy (Thermodynamic Potential at Constant Volume and Temperature), Gibbs' Function (Phase Potential, Thermodynamic Potential at Constant Pressure and Temperature), etc.
6. Thermodynamics of Chemical Processes.
7. Apparatus, *see* Supplementary Index.
8. Unclassified.

Cross-References :
Absolute Scale of Temperature, *see* Temperature.
Kinetic Theory, *see* Kinetic Theory of Matter.

2. Equations of State and Critical Phenomena. (Theoretical and Experimental.)

Disperse Gases. Part III. W. Luchsinger 26
Kinetic Theory of Fluids. S. C. Bradford 54
Special Type of Reciprocal Effect of Molecules in the Adsorption Layer. N. I. Kobosev and J. Goldfeld 75
P.V.T. Properties of Nitrogen at High Density. Part I. and II. M. Benedict 257
Quantum Theory of the Non-Ideal Gas. Part II. Behaviour at Low Temperatures. E. Beth and G. E. Uhlenbeck 258
Van der Waals Forces. A. J. Staverman 259
Superheating of Liquids. W. Döring 266
Physical Constants of Krypton. E. Mathias, C. A. Crommelin and J. J. Meihuizen 438
Experiments with Models to Determine the Ordinal State of Molecules in Liquids and in Gases of High Density. H. Rehaag and H. A. Stuart 461
Water Tolerances of Mixtures of Gasoline with Ethyl Alcohol. O. C. Bridgeman and E. W. Aldrich 484
Critical Solution Temperatures of Mixtures of Gasoline, *n*-Propyl Alcohol and Water. E. W. Aldrich 485
Equation of State of Gases and Critical Phenomena. J. E. Lennard-Jones 776
Generalisation of Boltzmann's Method for a van der Waals Gas. L. Waldmann 777
Gaseous Polymerisation and Equations of State. L. Herman 778
Fugacities in Gas Mixtures. I. R. Krichevsky 779
Van der Waals Reciprocal Effect of Inert-Gaslike Ions with Consideration of the Electronic Exchange. T. Neugebauer 780
Boiling Points and Critical Properties of Hydrocarbon Mixtures. R. L. Smith and K. M. Watson 788
System H_2-N_2-CO and CO Washing. M. Ruhemann and N. Zinn 789
Statistical Mechanics of Condensing Systems. Parts III and IV. J. E. Mayer and S. F. Harrison 979
Statistical Mechanics of the Adsorption of Gases at Solid Surfaces. F. J. Wilkins 988
Adsorption of A, N_2 and O_2 on Smooth Pt Foil at Low Temperatures and Pressures. F. J. Wilkins 989

Thermodynamics, *continued.*

Abstract Nos.

Accurate Determination of the Gas-Content of Steel Bottles. J. Otto 1682
Critical Phenomena in Gases. Part II. J. E. Lennard-Jones and A. F. Devonshire 1683
Forces Acting between Atoms and Ions and Physical Properties of Matter in Bulk. J. A. Wasastjerna 1786
Influence of Temperature and Pressure on the Volume and Refractive Index of Benzene. R. E. Gibson and J. F. Kincaid 1811
Relation of Electron Gas Pressure to Radiation Pressure in Degeneracy and Non-Degeneracy. D. S. Kothari and B. N. Singh 1910
Reutter's Heat Engine. H. Bock 2077
Thermodynamic Properties of Hydrocarbons. W. C. Edmister 2081
Thermodynamic Properties of Helium at High Pressure. W. Jacyna 2082
Equilibrium Isotherms and Isobars of CO-N_2-H_2 Mixtures. V. Fischer 2083
Joule and Joule-Thomson Effects. A. L. Clark and L. Katz 2084
Determination of Intermolecular Forces from the Joule-Thomson Coefficients. J. O. Hirschfelder, R. B. Ewell and J. R. Roebuck 2085
Emulsoidal State of Binary Liquid Systems above the Critical Miscibility Temperature. J. Frenkel 2228
Theory of the Liquid State. H. G. Trieschmann 2247
Relativistic Study of the Joule-Thomson Effect in a Gas. Part I. D. V. Gogate 2511
Theory of Condensation. B. Kahn and G. E. Uhlenbeck 2512
Theory of Liquids. A. Ganguli 2684
Statistical Mechanics of Condensing Systems. M. Born and K. Fuchs 2719
Thermodynamic Scale below 1° K. W. Jacyna, L. Malis and A. Obnorsky 2932
Regular Gas Solutions. I. R. Kritschewsky 3102
Density Differences at the Critical Point according to R. Plank's Equation of State. R. Ruedy 3316
Relationships between Parachor Values and the Physical Constants of Homologous Series. D. T. Lewis 3553
Dependence of Viscosity of Fluids on Molecular Volume, and Application of Principle of Continuity of State. D. T. Lewis 3564
Relation of Electron Gas Pressure to Radiation Pressure in Degeneracy and Non-Degeneracy. D. S. Kothari and B. N. Singh 3593
Complete Diagram of State of Binary Systems with Vapour Pressure Maxima. E. Jänecke 3777
Diagrams of State for Moist Gases. A. Stradelli 3778
Relativistic Study of the Joule-Thomson Effect and Adiabatic Processes in a Gas. Part II. D. V. Gogate 3779
Molecular Force and Imperfect Gases. Weng Wen-Po 4171
Corresponding-States Equation for General Physicochemical Computations. F. G. Keyes 4172
Peculiarities in Liquefaction of Helium. I. L. Zelmanov 4177
Complete Diagram of State of Binary Systems with Vapour Pressure Maxima. Part II. E. Jänecke 4592
Classification of State of Gaseous He, Ne and A. R. A. Buckingham 4593
Critical Temperature. I. Traube 4594
Molecular Theory of Gases. Part II. M. Trautz 4994
Thermal Hysteresis in HBr Transformations. A. Eucken and W. Güttner 4995
Persistence of Liquid State of Aggregation Above the Critical Temperature. R. L. McIntosh and O. Maass 4996
Low-Temperature Properties of Gaseous Helium. H. S. W. Massey and R. A. Buckingham 4997
Compressibilities of H_2 and of $H_2 + N_2$ Mixtures. R. Wiebe and V. L. Gaddy 4998
Equilibria in Two-Phase, Gas-Liquid Hydrocarbon Systems. Parts II and III. E. H. Boomer, C. A. Johnson and A. G. A. Piercey 5004
Velocity of Sound in A and D_2 at Liquid O_2 and H_2 Temperatures. Second Virial Coefficient of Argon. A. van Itterbeek and O. van Paemel 5009

3. Applications to Specific Heats and Latent Heats.

Atomic Forces of the Solid State. Part VII. Weng Wen-Po 499
Collective Electron Energy and Specific Heat. E. C. Stoner 2948
Transformations of Solid CD_4 and of its Mixture with CH_4. E. Bartholomé, G. Drikos and A. Eucken 2949

Thermodynamics, *continued.*

Abstract Nos.

Characteristic Temperature of MgO from X-Ray Measurements. H. S. Ribner and E. O. Wollan 3288
Theoretical Deduction of Latent Heat of Fusion. N. S. Binayendra 3318
Density of Energy States in Solids. S. H. Bauer 3780
Surface Tension and Internal Heat of Vaporisation. O. Albert and F. Eirich .. 4821

4. Phase Rule and Applications.

Critical Ordering Temperature in Alloys. Part II. C. E. Easthope 419
Lattice Changes Associated with the Formation of Superlattices in Alloys. A. H. Wilson 420
Phase Diagram of Water to 45,000 kg./cm². P. W. Bridgman 781
Position Exchange in Metallic Phases. C. Wagner 944
Preparation for the Formation of New Phases. A. Smits 2086
Thermodynamical Treatment of Stationary Processes in Polyphase Systems. W. Meissner 2513
Theory of Two-Component Systems Involving Solution Forces. K. Fredenhagen 2729
Effect of an Elastic Strain upon Thermostatic Equilibrium. J. E. Verschaffelt 3317
Solid-Liquid Equilibrium in Argon. O. K. Rice 3781
Electrical Conductivity and Phase Diagram of Ni-Mo Alloys. G. Grube and H. Schlecht 3809
Transformation II$\rightleftarrows$III of Solid H_2S and D_2S. K. Clusius and K. Weigand 4173
Low-Temperature Transformation of ND_4Br. Part I. A. Smits, D. Tollenaar and F. A. Kröger 4309
Electrical Conductivity and Phase Diagram of Ba Alloys with Bi, Mg, and Pb. G. Grube and A. Dietrich 4639
Phase Integrals and Thermodynamics. K. Husimi 4993
Formation of Surfaces in Liquid-Liquid Mixtures. W. W. Lepeschkin 4999
Ordering and Transformations in Condensed Phases. F. C. Frank and K. Wirtz and M. v. Laue 5000

5. Measurements of and Formulæ for Entropy, Internal Energy, Total Heat (Enthalpy), Free Energy (Thermodynamic Potential at Constant Volume and Temperature), Gibbs' Function (Phase Potential, Thermodynamic Potential at Constant Pressure and Temperature), etc.

Heat Capacity of Gaseous Propane, *n*-Butane, Isobutane, and *n*-Pentane. B. H. Sage, D. C. Webster and W. N. Lacey 243
Heats of Ionisation of Water, Ammonium Hydroxide, Carbonic, Phosphoric, and Sulphuric Acids. Variation of Ionisation Constants with Temperature and the Entropy Change with Ionisation. K. S. Pitzer 256
Entropy of Isoprene from Heat-Capacity Measurements. N. Bekkedahl and L. A. Wood 260
Thermodynamics in Hydrocarbon Research. C. L. Thomas, G. Egloff and J. C. Morrell 261
Expressions for First Partial Derivatives of Thermodynamic Functions. F. Lerman 262
Temperature Coefficient of the Standard Silver Electrode. Entropy of Silver Ion. J. J. Lingane and W. D. Larson 327
Adsorption Isotherms and Heats of Adsorption of Oxygen and Carbon Monoxide on Charcoal. A. van Itterbeek and W. van Dingenen 486
Intermolecular Forces in Two-Dimensional Systems. R. C. L. Bosworth and E. K. Rideal 487
Transitions of Solid CH_3D and CD_4. Entropy Relations of CH_3D and HD. K. Clusius, L. Popp and A. Frank 782
Third Law of Thermodynamics. F. Simon 783
Thermodynamic Functions of the Chloro- and Bromo-methanes, Formaldehrde and Phosgene. D. P. Stevenson and J. Y. Beach 784
Determination of Height and Energy Relationships by Means of the "Emagram H. Arakawa 1080
Molecular Heat, Heat of Fusion and Entropy of Fluorine. E. Kanda 1232
Intermolecular Forces in Two-Dimensional Systems. R. C. L. Bosworth and E. K. Rideal 1484
Validity of Nernst Heat Law at Absolute Zero. H. Schmolke 1681

Thermodynamics, *continued.*

Abstract Nos.

Joule-Thomson Effect in Mixtures of He and N_2. J. R. Roebuck and H. Osterberg 1684
Van der Waals Forces and the Debye-Hückel Theory of Strong Electrolytes. S. Oka 1685
Van der Waals Forces in Electrolytes. J. Lange and E. Herre 1686
Partial Molar Volumes of Strong Electrolytes at High Pressures. I. R. Kritschewsky 1853
Inner Rotation and Normal Vibrations of Ethane. Part I. E. Bartholomé and J. Karweil. Part II. W. Hunsmann 2031
Thermodynamic Treatment of Theory of Solutions. K. Fredenhagen 2087
Free Energy of Acetylene. A. R. Gordon 2088
Guggenheim's Theory of Strictly Regular Binary Liquid Mixtures. G. S. Rushbrooke 2291
Equivalence of Work and Total Heat at the Absolute Zero. M. di Jorio 2514
Thermodynamic Properties of Substances as a Function of Reduced Temperature. H. A. Fales and C. S. Shapiro 2515
Osmotic Pressure, Heat and Entropy of Dilution in the Systems Nitrocellulose-Cyclohexanone and Nitrocellulose-Acetone. C. G. Boissonnas and K. H. Meyer 2691
Energy Relationships in Aqueous Solutions of Noble Gases. E. Lange and R. Watzel 2728
Free Energy and Entropy of Nitrosyl Chloride. F. P. Jahn 2950
Thermodynamics of Supraconduction. M. v. Laue 2981
Magnetic Threshold Values for Supraconductivity. M. v. Laue 2982
Adsorption of He on Charcoal. A. van Itterbeek and W. van Dingenen 3111
Stefan's Radiation Law, Nernst's Heat Theorem and the Pressure of Radiation. E. Guth and A. E. Haas 3209
Thermal Data of Solid and Liquid SO_2. W. F. Giauque and C. C. Stephenson 3294
Thermodynamic Study of Cd-Sb System. H. Seltz and B. J. DeWitt 3319
Heat Capacities, Entropies, and Heats of Solution of Na_2SO_4, and Na_2SO_4, 10 H_2O. Application of the Third Law of Thermodynamics to Hydrated Crystals. K. S. Pitzer and L. V. Coulter 3320
Thermodynamic Properties of Propane. J. D. Kemp and C. J. Egan 3782
Communal Entropy and the Theory of Fusion. O. K. Rice........ 3783
Entropy of Ethyl Alcohol from Molecular Data and Equilibrium in Hydration of Ethylene. S. C. Schumann and J. G. Aston 3784
Entropy of Acetone and Isopropyl Alcohol from Molecular Data. Equilibrium in Dehydrogenation of Isopropyl Alcohol. S. C. Schumann and J. G. Aston 3785
Entropy of CO. R. Kaischew 3786
Vapour-Liquid Equilibrium. Part I. Apparatus for Study of System with Volatile Components. G. Scatchard, C. L. Raymond and H. H. Gilmann. Part II. Chloroform-Ethanol Mixtures at 35°, 45° and 55° C. G. Scatchard and C. L. Raymond 3788
Variation of Osmotic Pressure, Heat of Dilution and Dilution Entropy of High-Molecular Solutions with Temperature. G. V. Schulz 3921
OsO_4 in CCl_4 Solutions. L. H. Anderson and D. M. Yost 3966
Inner Rotation and Normal Vibrations of Ethane. Part III. K. Schäfer. Part IV. J. Goubeau and J. Karweil. Part V. J. Karweil and K. Schäfer........ 4126
Vibrational Spectrum and Thermodynamic Properties of Nickel Carbonyl. B. L. Crawford, Jr., and P. C. Cross 4127
Nernst Heat Theorem and Irreversible Processes at Low Temperatures. A. R. Ubbelohde 4174
Entropies of Aqueous Ions. W. M. Latimer, K. S. Pitzer and W. V. Smith 4175
Solution of Ions in Water. D. D. Eley and M. G. Evans 4595
Thermodynamic Properties of Methyl Bromide. C. J. Egan and J. D. Kemp 4596
Low-Temperature Heat Capacity Measurements on BF_3, CF_4 and SF_6. A. Eucken and E. Schröder 4980

6. Thermodynamics of Chemical Processes.

Thermodynamic Properties of Anhydrous Chlorides of Chromium. H. A. Doerner 263
Thermodynamics of Aqueous KCl-LiCl. B. B. Owen and T. F. Cooke, Jr. .. 264

For the **Key** to this Index see pp. 1182 to 1194.

Thermodynamics, *continued.*

Abstract Nos.

Thermodynamics of Aqueous HCl-HBr Mixtures. B. B. Owen and T. F. Cooke, Jr. 265
Molecular Interactions and Chemical Affinity. P. Girard and P. Abadie 403
Molecular Interaction and Polarisability. A. Michels, J. de Boer and A. Bijl 404
Calculation of Temperatures and Pressures of Combustion in a Closed Vessel. G. Ribaud 785
Reactions Kinetics. H. Eyring, M. G. Evans, M. Polanyi, E. Wigner, E. A. Guggenheim, J. Weiss, R. H. Fowler, N. B. Slater, E. A. Moelwyn-Hughes, C. N. Hinshelwood, A. Wassermann, M. W. Perrin, L. P. Hammet, H. B. Watson, C. L. Wilson, E. D. Hughes, R. P. Bell, K. J. Pedersen, W. F. K. Wynne-Jones, K. F. Bonhoeffer 786
Thermodynamic Properties of Sulphur and its Inorganic Compounds. K. K. Kelley 1687
Thermodynamic Properties of Metal Carbides and Nitrides. K. K. Kelley 1688
Thermodynamics of HCl in Dioxane-Water Mixtures from E. M. F. Measurements. Part II. H. S. Harned and C. Calmon. Part III. H. S. Harned. Part IV. H. S. Harned and J. G. Donelson 1689
Statistical Mechanical Treatment of the Absolute Rate of Chemical Reaction. J. Horiuti 2089
Thermodynamic Derivation of the E.M.F. of a Gas Voltaic Pile. O. Scarpa 2516
General Definition of Entropy and Bases of Chemical Thermodynamics. M. W. Mund 2517
Physico-Chemical States of Equilibrium. J. L. Finck 2518
Irreversible Processes at Absolute Zero. C. J. Gorter 3321
Nonadiabatic Reactions. Chemiluminescence. M. G. Evans, H. Eyring and J. F. Kincaid 3322
Recent Work on Voltaic E.M.F. O. Scarpa 3391
Absolute Rates of Heterogeneous Reactions. Part I. General Theory of Adsorption. G. E. Kimball 3787
Chemical Reactivity. H. W. Melville. 4099
Thermodynamics of HCl in Dioxane-Water Mixtures from E.M.F. Measurements. Part V. H. S. Harned and J. G. Donelson. Part VI. H. S. Harned and C. Calmon. Part VII. H. S Harned, J. G. Donelson and C. Calmon 4597
Exchange of Deuterium Between CH_3OH and D_2O. J. O. Halford and B. Pecherer 4598

8. Unclassified.

Activity Coefficients of KCl and $CaCl_2$. E. A. Guggenheim and L. A. Wiseman 482
Radiation Stresses of Transverse Inertial and Viscous Waves in Liquids. R. Lucas 762
Thermodynamics of Ionisation. K. H. Riewe 806
Laws of Equilibrium Displacement Applied to Mixtures of Liquids. P. M. Monval 1248
Thermodynamic Properties of N_2O_4 and NO_2. W. F. Giauque and J. D. Kemp 1249
Thermodynamics. J. H. Awbery 1250
Structure and Thermodynamic Properties of Long-Chain Compounds. Parts I and II. A. R. Ubbelohde 1251
Experimental Investigation of Thermo-Molecular Pressure Difference. S. Weber, W. H. Keesom and G. Schmidt 1438
Comparison of Results with Theory. S. Weber 1439
Experiments on the Thermo-Molecular Pressure Difference in the Region of the Boundary Condition $\varrho_1/\varrho_2=\sqrt{T_1T_2}$. S. Weber and G. Schmidt 1440
Equilibrium Conditions in Gases. S. Weber 1441
H.F. Longitudinal Waves in Viscous Fluids. R. Lucas 2090
Energy and Motion of Transverse Waves in Liquids. A. D. Fokker.......... 2091
Thermodynamic Properties of the Hexyl Alcohols. F. Hovorka, H. P. Lankelma and S. C. Stanford 2519
New Form of Resorcinol. Part I. Structure. Part II. Thermodynamic Properties. J. M. Robertson and A. R. Ubbelohde.......... 3061

For the **Key** to this Index see pp. 1182 to 1194.

Thermoelectricity.

1. Theory.
2. Thermoelectric Power, Peltier Coefficient, Thomson Coefficient.
3. Heating Effect of Current.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-Reference:
Thermoelectric Measurement of Temperature, *see* Temperature.

1. Theory.

Abstract Nos.

Theory of the Thermoelectric Properties of Alloys. T. Muto 4269

2. Thermoelectric Power, Peltier Coefficient, Thomson Coefficient.

Conductivity and Diffusion in the Semi-Metallic Alloys $Cu_{2-x}Se$. H. Reinhold, H. Möhring and H. Seidel 308
Electrical and Optical Properties of Oxides of Cd, Tl and Sn. G. Bauer...... 836
Influence of a Longitudinal Magnetic Field on the Thermoelectric Power of Ni and of Ferro-Nickels Submitted to Traction. G. Simon and J. Bouchard 899
Thermoelectric Power, Thomson Coefficient and Thermal Conductivity of Nickel. A. Hammer 1365
Thermo-E.M.F.s of Supraconductors Near Their Transition Points. W. H. Keesom and C. J. Matthijs 1366
Allotropy of Neodymium. F. M. Jaeger, J. A. Bottema and E. Rosenbohm 1380
Thermo-E.M.F. of Graphite-Silicon Carbide Couple. M. Dodero............ 2200
Influence of a Transverse Magnetic Field on the Thermoelectric Power of Nickel and Fe-Ni Alloys under Stress. G. Simon and J. Bouchard............ 2201
Electrical and Thermal Investigation of Manganin. Part II. A. Schulze.... 2563
Reference Table for Iron-Constantan and Copper-Constantan Thermocouples. W. F. Roeser and A. I. Dahl 2643
Thermo-E.M.F. of a Supraconductor against the Same Metal in the Non-Supraconductive State. W. H. Keesom and C. J. Matthijs 3040
Thermoelectric Effects in Homogeneous Conductors. M. Fraser 3041
Electrical Conductivity and Thermoelectric Characteristic of Semiconductors. B. M. Hochberg and M. S. Sominski 3814
Method of Least Squares and Thermoelectric Power of Rhodium. H. T. Wensel, L. B. Tuckerman, E. T. Booth and E. H. Dixon 3881
Conductivity of Transition Metals. A. H. Wilson 4206
Amplification of Thermo-E.M.F.s. R. Gunn 4733

3. Heating Effect of Current.

Calculation of Heating of Conductors by Current or by Radiation. J. Fischer 2202
Amorphous Carbon Resistance-Thermometer Heaters at Low Temperatures. W. F. Giauque, J. W. Stout and C. W. Clark 2937
Temperature Distributions of Linear Conductors Heated by Current or by Radiation. J. Fischer 3042
Construction of Filament Surfaces. R. P. Johnson 4365
Calculation of Temperatures of Strongly Heated Rods and Wires. J. Fischer 4579
Tungsten Fuses. T. Utiyama and R. Arai 4734

5. Unclassified.

Thermoelectric Actinometer with Built-in String Galvanometer. L. W. Pollak 560
Galena Light Detector. F. Fischer, B. Gudden and M. Treu.............. 2196
Surfaces of Vacuum Thermoelements. F. Kerkhof...................... 2203

Thermoelectric Probe for Measuring Gas Velocity. A. Sellerio 1550B

Time.

1. Solar and Stellar Time.
2. Secondary Standards.
3. Measurements.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References:
Pendulums, *see also* Mechanics, Classical.
Units, *see* Mathematical Methods, etc.

1. Solar and Stellar Time.

Clocks Showing Mean Solar and Sidereal Time Simultaneously. E. Esclangon 997

2. Secondary Standards.

New Form of Frequency and Time Standard. L. Essen 2189
New Schuler Clock. H. Gockel and M. Schuler 3560

Time, *continued.*

Abstract Nos.
Production of Accurate One-Second Time Intervals. W. D. George 4372
New Schuler Clock. A. Scheibe 4828

3. Measurements.

Measurement of Time. H. Spencer Jones 998
Application of H.F. Modulated Light to the Measurement of Short Intervals. P. Grivet 1494
Controlled 0·2-Second Pendulum. G. Turetschek 2313
Programme Selection in Transit Observations. J. Schive 3125
Dissipation of Energy by a Pendulum Swinging in Air. E. C. Atkinson 3525
Amplitude Deviation of Rate of a Pendulum. E. C. Atkinson 3526
Empirical Cosmology. P. Jordan 3579
Programme Selection in Time and Azimuth Determinations. T. Niethammer 4373

5. Unclassified.

Meaning of Uniform Time and the Kinematic Equivalence of the Extra-Galactic Nebulæ. E. A. Milne and G. J. Whitrow 2321
Linear Equivalence. E. A. Milne and G. J. Whitrow 2752

Time and Frequency. V. Yanouchevsky 77B
Timing Devices. P. M. Pflier 1868B

Transmission (Radiation).

1. Velocity of Propagation.
2. Diathermancy and Transparency.
3. Doppler Effect.
4. Signalling.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Absorption, *see* Absorption (Radiation).
Electric Waves, *see* Oscillation and Waves, Electric.
Visibility, *see* Meteorology *and* Vision.

1. Velocity of Propagation.

Application of H. F. Modulated Light to the Measurement of Short Intervals. P. Grivet 1494
Measurement of Velocity of Light over a Single Journey. R. J. Clark 4153

2. Diathermancy and Transparency.

Thermal Transmission of Textiles. R. S. Cleveland 232
Transmission of Oxides in the Far Infra Red. M. Parodi 233
Transmission of an Invisible Radiation through Various Chemical Solutions as Recorded by the Infra-Red Plate. L. C. Massopust 737
Transmission of Zinc Blende and of the Copper and Cadmium Halides in the Far Infra-Red. M. Parodi 738
Far Infra-Red Transmission of Benzene Derivatives. M. Parodi 1666
Optical Properties of Thin Pt Films. P. Rouard 2441
Vacuum Spectrograph. B. K. Johnson 2479
Turbidity and Particle-Concentration of As_2S_3 Sols during Coagulation. K. Hoffmann and H. A. Wannow 3050
Maintaining Transparency in Glass Observation Windows. C. W. Ockleford 3281
Spectral-Transmissive Properties and Use of Coloured Eye-Protective Glasses. W. W. Coblentz and R. Stair 3745
Reflection and Transmission Coefficients of Very Thin Metallic Layers. P. Rouard 4502
Spectral Transmissions of Absorbing Screens for Photometry. G. Déjardin, D. Cavassilas and R. Minangoy 4564
Designation of Filters for Theatrical Lighting. D. B. Judd 4565

3. Doppler Effect.

Doppler Effect Considered in Relation to the Michelson-Morley Experiment. H. E. Ives 481
Measurement of the Second-Order Doppler Effect. O. Scherzer 2915
Experimental Study of the Rate of a Moving Atomic Clock. H. E. Ives and G. R. Stilwell 3541
New Systems of Normal Coordinates for Relativistic Optics. G. Temple 4350

Transmission (Radiation), *continued.*

4. Signalling.

Abstract Nos.

Equivalent Luminous Intensity of Rotating Beacons. G. K. Neeland, M. K. Laufer and W. R. Schaub 3746
Flashing Character of Aerodome Floodlight Beacons. W. M. Hampton and J. G. Holmes 3747

6. Unclassified.

Optical Constants of Rubidium and Cæsium. H. E. Ives and H. B. Briggs.... 191
Spectral Investigation of Glucose Glass. W. M. Cohn 1224
Photometric Invariant. A. A. Geršun 1619

Vacua, High, *See* **Pressure.**

Vaporisation and Condensation.

1. Boiling Points.
2. Evaporation (Distillation).
3. Condensation (Liquefaction).
4. Vapour Pressure.
5. Apparatus, *see* Supplementary Index.
6. Unclassified.
Cross-References :
Hygrometers, *see* Meteorology.
Latent Heat, *see* Calorimetry.
Theory, *see* Thermodynamics.

1. Boiling Points.

Superheating of Liquids. W. Döring 266
Boiling Point of Water at Different Pressures. A. Zmaczynski and A. Bonhoure 787
Boiling Points and Critical Properties of Hydrocarbon Mixtures. R. L. Smith and K. M. Watson 788
Distillation and True Boiling-Point Curves of Complex Mixtures. E. M. J. Pease 2092
Water as a Reference Standard for Ebulliometry. W. Swietoslawski and E. R. Smith 2093
Thermodynamic Properties of the Hexyl Alcohols. F. Hovorka, H. P. Lankelma and S. C. Stanford 2519
Boiling Points of Benzene, Ethylene Chloride, *n*-Heptane, and 2, 2, 4-Trimethylpentane. E. R. Smith and H. Matheson 2520
Boiling Point and Chemical Constitution. Part I. An Additive Function of Molecular Weight and Boiling Point. V. C. E. Burnop 3323
Relationships between Parachor Values and the Physical Constants of Homologous Series. D. T. Lewis 3553
Refraction, Dispersion, and Related Properties of Pure Hydrocarbons, Arranged for Use in the Analysis of Hydrocarbon Mixtures. A. L. Ward and S. S. Kurtz, Jr. 4931
Boiling Point and Chemical Constitution. Part II. Calculation of Degree of Association at the Boiling Point. V. C. E. Burnop 5001

2. Evaporation (Distillation).

Ionisation Produced by the Evaporation of Water. E. Medi 129
Expansion of Vapours and Efficiency of Distillation. W. Świętoslawski and E. Ramotowski 267
Equilibration of Liquid and Vapour in a Rectifying Pan. M. Ruhemann .. 268
System H_2-N_2-CO and CO Washing. M. Ruhemann and N. Zinn 789
Vaporisation of SO_2 with Delayed Boiling and Bubble Formation. E. Haidlen 790
Evaporation of Falling Drops. N. Frössling 1091
Distillation and True Boiling-Point Curves of Complex Mixtures. E. M. J. Pease 2092
Purification and Magnetic Properties of Mercury. L. F. Bates and C. J. W. Baker 2177
Heats of Sublimation. K. L. Wolf and H. Weghofer 2510
Evaporation of Concentrated Films of Sodium. R. C. L. Bosworth 2521
Reflection Coefficient of Mercury. R. C. Mason 3697
Vapour-Liquid Equilibrium. Part I. Apparatus for Study of Systems with Volatile Components. G. Scatchard, C. L. Raymond and H. H. Gilmann. Part II. Chloroform-Ethanol Mixtures at 35°, 45° and 55°C. G. Scatchard and C. L. Raymond 3788
Vaporisation Coefficient of Water. H. Mache 4176
Plate Efficiency of Fractionating Columns. D. B. Keyes 4599

Vaporisation and Condensation, *continued.*

Abstract Nos.
Evaporation of Water into Quiet Air. B. F. Sharpley and L. M. K. Boelter .. 4600
Evaporation from Free Water Surface by Perpendicular Air Stream. M. C. Molstad, P. Farevaag and J. A. Farrell 4601
Continuous High-Vacuum Still and Boiling-Point Apparatus, and the Systematic Distillation of a Dewaxed Lubricant Fraction of Petroleum. R. T. Leslie and E. E. Heuer 5002

3. Condensation (Liquefaction)

Condensation and Adsorption of Mercury Vapour. R. C. Mason 1482
Condensation on Board Ship. S. J. Duly 2094
Extension of Nusselt Theory of Heat Interchange at Condensation. G. Krujilin 2522
Nature of Ionic Sign Preference in Wilson Cloud Chamber Condensation Experiments. L. B. Loeb, A. F. Kip and A. W. Einarsson 2951
Peculiarities in Liquefaction of Helium. I. L. Zelmanov 4177
Production of Condensation Nuclei in the Presence of Electrical Charges. G. Tohmfor and M. Volmer 5003

4. Vapour Pressure.

Photochemistry of Alkyl Nitrites. H. W. Thompson and F. S. Dainton 171
Measurements of Liquid Helium Temperatures. Parts I and II. G. Schmidt and W. H. Keesom 252
Thermodynamic Properties of Anhydrous Chlorides of Chromium. H. A. Doerner 263
Vapour Pressure and Dissociation of Tungsten Hexachloride in the Gas Phase. A. A. Vernon 269
Pressures of Permanent Gases at Low Temperatures in Presence of Silica Gel. R. Delaplace 270
Fusion Point, Vapour Pressure and Heat Evaporation of Vanadium Oxytrichloride. H. Flood, J. Gørrissen and R. Veimo 765
Influence of Intensive Desiccation on the Vapour Pressure of Benzene. D. A. Lacoss and A. W. C. Menzies 791
Dissociation Pressures of Sodium Deuteride and Sodium Hydride. E. F. Sollers and J. L. Crenshaw 792
Dissociation Pressures of Hydrides and Deuterides of Sodium and Potassium. A. Borocco 793
Estimation of Deuterium. P. Harteck 794
Diffusion and Vapour Pressure of Zinc in Brass. W. Seith and W. Krauss .. 795
Vapour Pressure of Liquids and Solids. J. K. Syrkin 1252
Dissociation Pressures of Deuterates of Cupric Sulphate and of Strontium Chloride. F. T. Miles and A. W. C. Menzies 1253
Sorption Hysteresis and the Vapour Pressure of Concave Surfaces. L. H. Cohan 1480
Extension of the Macleod Equation. D. T. Lewis 1492
Vapour Pressures of the Polyethylene Glycols and their Derivatives. A. F. Gallaugher and H. Hibbert 1690
Validity of Henry's Law of the Calculation of Vapour Solubilities. J. H. Saylor, J. M. Stuckey and P. M. Gross 1691
Dissociation Pressures of the Hydrides and Deuterides of Rubidium and Caesium. A. Borocco 2523
Effect of Intermolecular Forces in Gases and Liquids. E. Steurer and K. L. Wolf 2524
Measurements of Low Vapour Pressures of Alkali Halides. J. E. Mayer and I. H. Wintner 2952
Dipole Interaction in Mixtures of Water with Methyl, Ethyl, and *n*-Propyl Alcohols, and of Ethyl Alcohol with *n*-Heptane. A. R. Martin and A. C. Brown 2953
Vapour Pressure of Propane. P. Harteck and R. Edse 3789
Evidence of Validity of Raoult's Law. H. H. Gilmann and P. Gross 3790
Activity and Osmotic Coefficients of Trivalent Metal Chlorides. C. M. Mason 3791
OsO_4 in CCl_4 Solutions. L. H. Anderson and D. M. Yost 3966
Activity Coefficient of $CoCl_2$ in Aqueous Solution. R. A. Robinson 4178
Complexity of P_2O_5. A. Smits, J. A. A. Ketelaar and J. L. Meijering 4281
Complexity of Aluminium Chloride. A. Smits, and J. L. Meijering 4282
Equilibria in Two-Phase, Gas-Liquid Hydrocarbon Systems. Parts II and III. E. H. Boomer, C. A. Johnson and A. G. A. Piercey 5004

For the Key to this Index see pp. 1182 to 1194.

Vaporisation and Condensation, *continued.*

6. Unclassified.

Abstract Nos.
Thermal Properties of Heavy Hydrogen. K. Clusius 774
Thermal Properties of Heavy Water. E. Lange 775
Heat. R. W. Powell 1243
Sublimation and Diffusion of Salts and Metals. T. Peczalski 3324

Vapour Pressure, *See* **Vaporisation and Condensation.**

Velocity of Light, *See* **Transmission (Radiation).**

Viscosity and Friction.

1. Theory.
2. Measurement of Viscosity.
3. Relations between Viscosity and Other Properties.
4. Friction of Solids (Internal and External).
5. Apparatus, *see* Supplementary Index.
6. Unclassified.

Cross-References :
Lubrication, *see* Surface Properties *and* Section B.—Electrical Engineering.
Viscosity of Colloids, see Colloids.

1. Theory.

Kinetic Theory of Fluids. S. C. Bradford 54
Viscosity of Liquids. G. I. Taylor, J. D. Bernal. A. S. C. Lawrence, E. N. da C. Andrade, E. Hatschek, R. K. Schofield 90
Verification of Stoke's Theory of a Sphere Oscillating in a Liquid. D. S. Subrahmanyam 455
Viscosity and Chemical Constitution. M. Souders, Jr. 999
Viscosity of Solutions of Thread Molecules. I. Sakurada 1496
Free Discharge of Liquids from Capillary Tubes. A. Grumbach 1873
H.F. Longitudinal Waves in Viscous Fluids. R. Lucas 2090
Reaction Rate Theory of Viscosity and Some Applications. R. H. Ewell .. 2314
Flow of Viscous Substances. W. Philippoff 2658
Theory of Liquids. A. Ganguli 2684
Molecular Force and Viscosity of Gases. Weng Wen-Po 2747
Viscosity of Unimolecular Films. W. J. Moore, Jr. and H. Eyring 3122
Equation for Viscosity of Mixtures. S. K. Chakrabertty and P. B. Ganguly 3126
Intermolecular Forces. J. N. Friend 3443
Rates of Displacement in Viscous Bodies under Applied Stress. R. W. Douglas 3563
Dependence of Viscosity of Fluids on Molecular Volume, and Application of Principle of Continuity of State. D. T. Lewis 3564
Vibration of Molecules in Liquids and its Relation to Viscosity. D. B. MacLeod 3939
Viscosity Function. E. P. Irany 4374
Rates of Displacement in Viscous Bodies under Applied Stress. R. W. Douglas 4829
Viscosity of Dilute Solutions of Long-Chain Molecules. Part I. M. L. Huggins 4830
Molecular Theory of Gases. Part II. M. Trautz 4994

2. Measurement of Viscosity.

Viscosity of Fluorine Gas at Low Temperatures. E. Kanda 91
Initial Flow of a Viscous Fluid. H. Poncin 1000
Vibration Viscometry. R. Auerbach 1001
Viscosity of Liquid Helium below the λ-Point. P. Kapitza 1497
Decay of Circular Waves on Water. J. Baurand 1821
Viscosity of Oils at High Temperatures. G. Barr 1874
Graphical Solutions of Viscosity Problems. J. Groff 1875
Viscosity of Dilute Solutions of Strong Electrolytes. E. Asmus 1876
Viscosity of Slag Systems. J. R. Rait and R. Hay 1877
Viscosity of Helium Gas between 293° and 1·6°K. A. van Itterbeek and W. H. Keesom 1878
Constitution and Viscosity Association of High-Molecular Hydrocarbons B. Yamaguchi 1879
End Correction of Cylindrical Tube Traversed by Current of Gas. A. Foch, A. Fortier and J. Fivet 2315
Theory of Oscillating Disc Method of Measuring Viscosity and Slip of Fluids. G. E. Macwood 2316

Viscosity and Friction, *continued.*

Abstract Nos.
Thermodynamic Properties of the Hexyl Alcohols. F. Hovorka, H. P. Lankelma and S. C. Stanford 2519
Viscosity of Air, Oxygen and Nitrogen. P. J. Rigden 3565
Influence of Surface Tension on Viscosity Measurement. Viscosity of Methanol G. Jones and H. J. Fornwalt 3566
Viscosity of Liquid and Gaseous Propane. B. H. Sage and W. N. Lacey 3567
Viscosity of Liquid Helium. W. H. Keesom and G. E. Macwood 3568
Viscosity of Hydrogen Vapour. W. H. Keesom and G. E. Macwood 3569
Theory of Oscillating Disc Method of Measuring Viscosity and Slip of Fluids. Part II. G. E. Macwood 3570
Viscosity of Liquid Hydrogen. W. H. Keesom and G. E. Macwood 3571
Viscosity and Density of Aqueous Solutions of Weak Electrolytes at 35° C. M. K. Srinivasan and B. Prasad 3983
Structural Viscosity of Softening Selenium Glass. E. Jenckel 4375
Viscosity of Air. V. D. Majumdar and M. B. Vajifdar 4376
Effect of Pressure on Viscosity of Boric Anhydride Glass. E. B. Dane, Jr. and F. Birch 4377
Surface Viscosity of Long-Chain Alcohol Monolayers. L. Fourt and W. D. Harkins 4825
Viscosity of Aniline. L. A. Steiner 4831
Viscosity of Starch Pastes. J. R. Katz, M. C. Desai and J. Seiberlich 4832

3. Relations between Viscosity and other Properties.

Influence of Temperature and Specific Volume of the Viscosity of Liquids. W. R. van Wijk and W. A. Seeder 92
Temperature-Variation of Viscosity of Strongly Associated Liquids. B. Derjaguin and M. Kussakow 93
Viscosity of Aqueous Solutions of Electrolytes. Part III. H. Tollert 94
Dielectric Polarisation and Viscosity of Liquid Chloronitrobenzene. A. Jagielski 315
Effect of Magnetic Field on Viscosity of Gases. H. Senftleben and H. Gladisch 502
Action of Magnetic Field on Viscosity of *p*-Azoxyanisole. W. N. Zwetkoff and G. M. Michailoff 1880
Diffusion and Viscosity in Binary Liquid Mixtures. H. Lemonde 2251

4. Friction of Solids (Internal and External).

Solid Friction. J. Mercier and J. Dubois 503
Internal Friction in Solids. Part II. General Theory of Thermoelastic Internal Friction. C. Zener 504
Internal Friction in Solids. Part III. Experimental Demonstration of Thermoelastic Internal Friction. C. Zener, W. Otis and R. Nuckolls 505
Flow of a Granular Mass. K. Takahasi 551
Solid Friction in Dielectric Losses. A. Gemant 1296
Internal Friction in Solids. Part IV. Relation between Cold Work and Internal Friction. C. Zener 1881
Operational Theory of Solid Friction. L. A. Pipes 2748
Internal Friction in Solids. Part V. General Theory of Macroscopic Eddy Currents. C. Zener 3127
Internal Friction of Wood. F. Krüger and E. Rohloff 3984
Rôle of Solid Friction in Synthetic Dielectrics. A. Gemant 5042

6. Unclassified.

Dilatancy and its Relation to Thixotropy. H. Freundlich and H. L. Röder 917

Vision.

1. Theories of Vision.
2. Phenomena of Vision.
3. Optics of the Eye.
4. Apparatus, *see* Supplementary Index.
5. Unclassified.

Cross-References :
Measurement of Colour, *see* Colorimetry.
Visibility, *see also* Meteorology.

1. Theories of Vision.

Intrinsic Properties of the Colour Domain. L. Silberstein 1969
Area and Visual Threshold. G. Wald 2053
Photochemical Basis of Vision. S. Hecht 2483
Duplexity Theory of Visual Response in Vertebrates. W. J. Crozier, E. Wolf and G. Zerrahn-Wolf 2484

For the **Key** to this Index see pp. 1182 to 1194.

Vision, *continued.*

Abstract Nos.
Structure of the Retina and the Rôle of Visual Purple. R. J. Lythgoe 2487
Attributes of Colours and Colour Measurement. W. Ostwald 3208
Eye and Brain as Factors in Visual Preception. R. G. Thouless 4566

2. Phenomena of Vision.

Subjective Study of Colour Mixtures. V. H. Pavlović 153
Integrating Power of the Eye for Short Flashes of Light. T. E. Gilmer 182
Factors in Dark Adaptation. C. A. Elsberg and H. Spotnitz 234
Apparent Enlargement of the Sun at Rising and Setting. V. Cornish 544
Photoelectric Transmission Spectrophotometer for the Measurement of Photosensitive Solutions. S. Shlaer 732
Critical Illumination and Flicker Frequency in Related Fishes. W. J. Crozier, E. Wolf and G. Zerrahn-Wolf 739
Intensity and Critical Frequency for Visual Flicker. W. J. Crozier, E. Wolf and G. Zerrahn-Wolf 740
Visual Adaptation and Chemistry of the Rods. G. Wald and A. B. Clark 741
Relation between Visual Acuity and Illumination. S. Shlaer 742
Visual Acuity. K. U. Smith 743
Effect of Temperature on the Photochemical Bleaching of Visual Purple Solutions. H. J. A. Dartnall, C. F. Goodeve and R. J. Lythgoe 744
Retinal and Photographic Resolving Powers. V. Ronchi 1225
Ultra-Short Illumination of the Eye. B. Deriagin 1226
Diffraction, Mach Effect and Supplementary Fringes. F. Wolfers 1995
Binocular Summation during Dark Adaptation. R. J. Lythgoe and L. R. Phillips 2054
Response of Single Optic Nerve Fibres of the Vertebrate Eye to Illumination of the Retina. H. K. Hartline 2055
Visual Purple and Rod Vision. H. F. Blum 2056
Minimal Discrimination of Intensities. Part III. W. J. Crozier and A. H. Holway 2485
Time of Adaptation after Glare. E. Perucca, C. Brigatti and R. Deaglio 3282
Temperature and the Critical Intensity for Response to Visual Flicker. W. J. Crozier, E. Wolf and G. Zerrahn-Wolf 3283
Specific Constants for Visual Excitation. W. J. Crozier, E. Wolf and G. Zerrahn-Wolf 3284
Adaptometer for Measuring Human Dark Adaptation. S. Hecht and S. Shlaer 3285
Spectral-Transmissive Properties and Use of Coloured Eye-Protective Glasses. W. W. Coblentz and R. Stair 3745
Effect of Adaptation on Differential Brightness Discrimination. K. J. W. Craik 3748
Brightness Discrimination and Duration of Increment. C. H. Graham and E. H. Kemp 3749
Impulses in the Optic Nerve of Pecten. H. K. Hartline 3750
Influence of Acoustic Stimuli Upon the Limits of Visual Fields for Different Colours. P. A. Yakovlev 3751
Anomalous Trichromatism and its Relation to Normal Trichromatism. J. H. Nelson 3752
Colour Sensations Produced by U.V. Light. A. G. Gaydon 3753
Tungsten, Mercury and Sodium Illuminants at Low Brightness Levels. M. Luckiesh and A. H. Taylor 4102
Vision in Nature and Vision Aided by Science. (Lord) Rayleigh 4154
Simplified and Compact Tricolour Mixing Device. C. N. Warfield 4466
Optical Resolution and Visual Examination of Two Overlapping Photographic Images. J. K. Robertson and R. H. Hay 4567

3. Optics of the Eye.

Absorption Spectrum of Visual Purple. A. M. Chase and C. Haig 3754
Luminosity of Telescope Images. V. Ronchi 4508
Position of the Exit Pupil of Telescopes. C. v. Hofe 4509
Diving Glasses. J. Mendousse 4568
Vision Through Optical Instruments. T. Smith 4967

5. Unclassified.

Sedimentation Constant of Visual Purple. S. Hecht and E. G. Pickels 2486
Stereoscopic Drawings. J. T. Rule 4569

Visibility of Reading Tasks. L. H. Brown, L. G. Gianini and T. A. Robinson 2763B

For the **Key** to this Index see pp. 1182 to 1194.

X-Rays.

1. Phenomena of the X-Ray Tube.
2. Reflection, Refraction, Diffraction and Scattering.
3. Absorption and Ionisation.
4. Emission Spectra.
5. Absorption Spectra.
6. Measurements of Intensity, Quality, Wave-Length, etc.
7. Chemical and Photographic Action.
8. Applications (Industrial Radiography and Chemical Analysis).
9. Apparatus, *see* Supplementary Index.
10. Unclassified.

Cross-References :
Constitution of Atoms and Molecules, *see* Atomic and Molecular Structure.
Photoelectric Emission by X-Rays, *see* Photoelectricity.
Polarisation of X-Rays, *see* Polarisation (Radiation).
Radiography (Medical) and Radiotherapy, *see* Medical Radiology and Electrology, *and* Section B.—Electrical Engineering.
Structure of Crystals, *see* Crystal Structure and Special Properties.

1. Phenomena of the X-Ray Tube.

	Abstract Nos.
Distribution of X-Rays from a Massive Antikathode. H. Determann	235
X-Rays from Radio Valves. H. D. Simons, G. L. Clark and O. C. Klein	745
Production of X-Rays by High Speed Argon Ions. M. Tanaka and I. Nonaka	1667
Heating of a Crystal by the Kossel Effect. M. v. Laue	2488
Breakdown in Vacuum Tubes in High Voltages. H. Neuert	2546
Short-Wave X-Rays. W. D. Coolidge	3031
Automatic Regulation of Current in Shearer X-Ray Tube. H. le Caine	3286
X-Ray Tube for Crystal Analysis and Stress Measurements. J. E. de Graaf and W. J. Oosterkamp	4155
Breakdown in X-Ray Tubes. N. C. Cordingly	4716

2. Reflection and Refraction, Diffraction and Scattering.

Occurrence of " Forbidden " X-Ray Reflections. E. Brandenberger	236
Focusing of X-Rays with Crystal of Variable Curvature. V. Dolejšek and M. Tayerle	237
Measurement in Absolute Units of the Intensities of X-Ray Reflections from Crystalline Powders. G. W. Brindley and F. W. Spiers	238
Atomic Scattering Factors of Aluminium, Potassium Chloride and Copper for X-Rays. G. W. Brindley and P. Ridley	239
Simultaneous Reflection of X-Rays and Indirect Excitation. M. Blanc and J. Weigle	746
Further Study of X-Ray Diffraction in Quartz. G. W. Fox and J. R. Frederick	747
Spectral Distribution of Scattered X- and γ-Rays. R. Payne-Scott	889
Non-Characteristic White and Black Lines in the X-Ray Spectra Obtained by Crystal Diffraction. Y. Cauchois and H. Hulubei	1227
Theory of Scattering of X-Rays by Crystals of Variable Structure. I. M. Lifschitz	2057
Focusing of X-Ray Beam by a Rock-Salt Crystal. R. M. Bozorth and F. E. Haworth	2058
Use of Intensifying Screens in X-Ray Diffraction Work. C. Gamertsfelder and N. S. Gingrich	2489
X-Ray Detection of Lattice Distortion and Determination of Particle Size. R. Fricke	2490
X-Ray Measurement of Particle Size. F. W. Jones	2491
X-Ray Examination of Fine Particles and Colloidal Suspensions. A. Guinier	2660
Crystal-Size in Metal and Metal-Oxide Smokes. D. Beischer	2665
Experimental Verification of the Quantum-Mechanical Dispersion Theory by Reflection and Diffuse Scattering of X-Rays from Zinc. W. A. Bruce	2916
X-Ray Surface Reflection Fields and their Application to Absorption Corrections and to Background Patterns. M. J. Buerger	3054
New Type of X-Ray Diagram. A. Guinier	3057
Atomic Vibrations of a Zn-Cu Alloy. R. A. Howard	3058
Total Reflection and Dispersion of X-Rays. T. Derenzini	3287
Characteristic Temperature of MgO from X-Ray Measurements. H. S. Ribner and E. O. Wollan	3288
Diffraction of X-Rays by a Crystal. J. Laval	3459
Compton Scattering of Radiation in a Star. A. B. Severny	3594
Atomic Vibrations in Mg. G. W. Brindley and P. Ridley	3907
Technique of X-Ray Spectral Analysis. P. Brauer	4156
X-Ray Diffraction of Substances under High Pressures. R. B. Jacobs	4157

X-Rays, *continued.*

Abstract Nos.

Diffuse Scattering of X-Rays from Piezoelectrically Oscillating Quartz. G. E. M. Jauncey and W. A. Bruce 4263
Scattering of X-Rays by Liquids, particularly Tertiary Aliphatic Amines. R. N. Bapat 4280
Integration of Large Numbers of X-Ray Crystal Reflections. R. H. V. M. Dawton 4312
Reflection Patterns of X-Rays with Crystals. T. Fujiwara and I. Takesita 4570
Effect of a Direct Electric Field on Laue Diffraction Photograms. A. Němejcová and J. Brož 4571
Azimuthal Intensity Distribution of X-Rays. K. Böhm 4968
X-Ray Scattering at Small Angles. K. Alexopoulos and S. Peristerakis 4969
Estimation of X-Rays Incoherently Scattered by Gases. K. Hoffmann 4970
Scattering and Photoelectric Absorption of H.V. X-Rays in Nitrogen. H. C. Trueblood and D. H. Loughridge 4971
Determination of e/m from Refraction of X-Rays in a Diamond Prism. J. A. Bearden 5050

3. Absorption and Ionisation.

Collodion Filter for Kα Chromium Radiation. S. S. Sidhu 748
Theory of X-Ray Absorption and Heat of Sublimation of Zinc. M. Satô 1668
State of Equilibrium between Large Ions and Ions Produced by X-Rays in a Gas. Ouang Te-Tchao and A. M. Moulin 2917
Mass Absorption Coefficients of Monochromatic X-Rays in Water and Aqueous Solutions. I. Müller 4158
Effect of Filtration on Divergent Beams at Super-Voltages. H. S. Hayden, K. E. Corrigan and B. Cassen 4711
Attenuation and Transition Effects in the Absorption of Supervoltage Radiation. B. Cassen, K. E. Corrigan and H. S. Hayden 4712

4. Emission Spectra.

Influence of Lattice Binding on the K-Lines of Boron. E. Gwinner and H. Kiessig 240
Multiple Ionisation of Inner Electron Shells of Atoms. F. K. Richtmyer .. 241
Search for Element 87 (Moldavium). H. Hulubei 242
Soft X-Ray Bands from Dilute Alloys. H. W. B. Skinner and J. E. Johnston 749
L-Series of Elements 32 Ge to 19K. F. Tyrén 1228
Lα Satellites for Element 82 (Pb). M. Valadares and F. Mendes 2059
Lα and Lβ lines of the Elements from Fe to Ge, and of their Compounds and Alloys. E. Gwinner 2060
Theory of Continuous X-Ray Spectrum near the Duane-Hunt Limit. E. Brunner 2061
L-Spectrum of Fe. J. Farineau 2492
Extension of the X-Ray Spectrum towards the Optical. M. Siegbahn 3289
L-Series of Ag. L. G. Parratt 3755
Electronic Structure of Metals. J. Farineau 3906
M-Series of Elements from Cd(48) to Ce(58). H. Kiessig 4159
Moseley Law X-Ray Tube for Atomic Physics Laboratories. B. Sway and D. A. Wells 4572
K-Spectra of As, Se and Br. M. L. Allais 4573
Intervals of X-Ray Spin-Doublets. G. Araki and S. Noma 4972

5. Absorption Spectra.

Influence of Chemical Binding on X-Ray Absorption Spectra. R. Landshoff 2918

6. Measurements of Intensity, Quality, Wave-Length, etc.

Resolving Power in X-Ray Spectra. V. Dolejšek and M. Tayerle 750
Curved Quartz Crystal X-Ray Spectrograph and Determination of Grating Constant of Quartz. B. B. Watson 751
L-Spectra and Characteristic Levels of Thorium. Y. Cauchois and M. L. Allais 1229

X-Rays, *continued.*

Abstract Nos.

Effect of Electrode Thickness and Disposition on X-Ray Measurements. W. Wehrheim 2062
Integrated Intensity of Powder Photographs. E. O. Wollan 2063
Absolute X-Ray Intensity Measurement. A. Drigo 3290
Sensitivities of X-Ray Counters and Films. A. Drigo 3291
Measurement of Supervoltage X-Rays with the Free-Air Ionisation Chamber. L. S. Taylor, G. Singer, and A. L. Charlton 3756
Measurement of X-Ray Intensities with a Counter. P. Ohlin 4160
Absolute Wave-Length of $K\alpha_{1,2}$ Line of Al. F. Tyrén 4161
Ionisation of Air by X-Rays of Different Hardness and Different Degrees of Homogeneity up to 400 kV. W. I. Block 4574

7. Chemical and Photographic Action.

Validity of the Bunsen-Roscoe Law for the Photographic Action of X-Rays of Long Wave-Length E. Mülbach 752
Chemical Reactions of Organic Compounds with X-Ray Activated Water. H. Fricke, E. J. Hart and H. P. Smith 2919
Chemical Activity of Gas Ions: Decomposition of Azomethane under the Influence of X-Rays. P. Günther and H. Theobald 2920
Action of Ionising Radiations on Colloidal Graphite. J. A. Crowther, H. Liebmann and R. Jones 3292
Thermo-Luminescence of Quartz Exposed to X-Rays. T. Futagami 3669
Effects of Radiation on Oil. W. Stenstrom and I. Vigness 4973

8. Applications (Industrial Radiography, and Chemical Analysis).

X-Ray and Magnetic Analysis of Deformed Silicon Steel Rings. G. L. Clark and C. G. Dunn 355
Metallic Intensifying Screens. H. E. Seemann 888
X-Ray Micro-Analyser. L. v. Hámos 1670
X-Ray Spectroscopic Determination of La, Nd and Gd in the Presence of Other Rare-Earth Elements. K. Kimura 2064
X-Ray-Spectroscopic Quantitative Analysis of Nb, Y and Sr in Zirconium Minerals. M. Blokhin 2493
Quantitative X-Ray Analysis. K. Schäfer 2921
Localisation of Object by X-Rays. H. Steinhaus 2922
X-Ray Investigation of Failure of Metals. H. J. Gough and W. A. Wood 3071
X-Ray Investigation of the Form of Acetylsalicylic Acid in Certain Sugars. S. S. Sidhu 3757
Physics in Pharmacy. R. L. McFarlan 4563
Method of Gas Analysis Based upon the Optical-Acoustic Tyndall-Röntgen Effect. M. Veingerov 4575
Influence of Elastic Anisotropy on X-Ray Measurement of Strain. R. Glocker 4974

10. Unclassified.

U.V. Luminescence of Rock-Salt After Irradiation by X-Rays. M. L. Katz .. 1150
Characteristics of X-Rays. J. L. Weatherwax 4717

Small X-Ray Apparatus for Diffraction Work. Bourek 331B
Production of Super-Voltage X-Rays by Means of an Electrostatic Generator. R. Dresser, J. Trump and R. J. van de Graaff 446B
Dosage Measurements on Ten 400-kV X-Ray Generators. O. Glasser 467B
X-Ray Stereometer. C. D. Moriarty 2695B
Analysis by X-Ray Diffraction. J. D. Hanawalt, H. W. Rinn and L. K. Frevel 3257B
X-Ray Tube for Analysis of Crystal Structure. J. E. de Graaf and W. J. Oosterkamp 3479B

Zodiacal Light and Gegenschein.

Variation of Light from Night Sky and its Effect on Photography of Faint Nebulae. C. T. Elvey and P. Rudnick 515
Origins of the Zodiacal Light. J. Larmor 1072
Galactic Matter and the Zodiacal Light. B. Fessenkoff 4016
Astrophysics at North Pole. B. G. Fessenkoff 4416
Origin of Zodiacal Light. B. G. Fessenkoff 4417

SUPPLEMENTARY INDEX OF APPARATUS AND INSTRUMENTS.

Names of Apparatus and Instruments are arranged in Alphabetical Order.

A

Abstract Nos.

Accelerometers.
Electrical Instruments. G. F. Shotter 1290
Earthquake Accelerometers on Shaking Table. H. E. McComb and A. C. Ruge 1560
Mechanical and Thermal Instruments. G. A. Tomlinson 1675
Actinometers, *see also* Ultra-Violet Intensity Meters.
Thermoelectric Actinometer with Built-in String Galvanometer. L. W. Pollak 560
Radiometric Measurements of U.V. Solar Intensities in the Stratosphere. R. Stair and W. W. Coblentz 1079
Blueness of Sky and U.V. Radiation. H. Landsberg and H. Jobbins 1934
Adaptometers.
Adaptometer for Measuring Human Dark Adaptation. S. Hecht and S. Shlaer 3285
Air Conditioning Apparatus.
Hygrometry. Part II. H. Ebert 2365
Altimeters.
Aerological Height Computator. E. G. Bilham 2373
Ammeters, *see also* Galvanometers.
Measurement of Current at Radio Frequencies. T. I. Jones 1279
Null Methods of Calibrating Sensitive A.C. Instruments. W. Hohle and W. Rump 2108
Absolute A.C. Measurements and Calibration of Thermocouples up to 500 Mc./sec. M. J. O. Strutt and K. S. Knol 2129
Trends of Instrument Design. C. C. Mason 4644
Amplifiers.
Reflection of α-Rays of RaC′ by Heavy Atomic Nuclei. K. Krammer 146
Quantum-Counter Amplifiers for γ-Ray Detection. Robley D. Evans 362
Apparatus for Supersonic Research. A. Noyes, Jr., and G. W. Pierce 1258
Valve Amplifier for Weak Currents. F. Bedeau and L. Herman 2132
Differential Amplifier. J. F. Toennies 2133
Oceanographic Current Recorder. H. Dahl and O. Dahl 4019
Intermittent Amplifier for Rapid Counting of Geiger-Müller Impulses. L. Kowarski and S. Winter 4064
Be Isotope of Mass 8. O. Laaff 4450
Direct-Voltage Amplifier. E. L. E. Wheatcroft 4634
Amplification of Thermo-E.M.Fs. R. Gunn 4733
Differential Amplifier for Electrophysiology and for Bridge Measurements. H. König 5067
Anemometers.
Photoelectric Anemometer for Studying Atmospheric Turbulence. R. Faillettaz 1549
Robinson Cup-Anemometer and Various Types of Vanes. T. Sano 2803
Sensitivity of Immersed Venturi-Pitot Head at Low Speeds. C. Salter 3938
Katabatic Winds and Prevention of Frost Damage. C. E. Cornford 4428
Anemoclinometer I.M.F.L. G. T. Walker 4871

Abstract Nos.

Astrolabes, Prismatic.
- Measurement of Time. H. Spencer Jones 998

Atmospheric Recorders.
- Recording of Atmospherics and Forecasting of Storms. R. Failletaz 1106

Azimuth Circles.
- Measurement of Angles. C. Schmerber, P. Tardi and P. Caillol 4336

B

Balances, Current.
- Corrections for Winding Space of Coils of Rayleigh Current Balance. H. v. Steinwehr and W. Gremmer 2976

Balances, Gravimetric.
- Vertical and Horizontal Film Balances. W. D. Harkins and T. F. Anderson 89
- Simple Spring Torsion Balance. A. C. Fabergé 462
- Works Balance for Maximum Load 0.1 mg. W. W. Loebe and R. Kühn 963
- Brownian Movement of a Torsion Balance. E. Kappler 1829
- Electronic Recording Analytical Balance. R. H. Muller and R. L. Garman 3944

Balances, Magnetic.
- Paramagnetic Measurements at Low Fields with the Rankine Balance. H. P. Iskenderian 883

Balloons.
- Pilot Balloons and Sources of Light for Upper-Wind Observations. W. H. Wenstrom 1095
- Atmospheric Exploration by Radio-Sounding Balloons. H. A. Thomas 3615
- Pilot Balloon Theodolite. R. Cranna 4870

Bearings.
- Ball-Bearings. Mechanical and Thermal Instruments. G. A. Tomlinson 1675

Bolometers.
- Dielectric Bolometer. P. Moon and L. R. Steinhardt 2859

Braun Tubes, *see* Oscillographs, Kathode-Ray.

Bridges.
- Simple Bridge for Comparison of Low Resistance Standards. D. C. Gall 3356
- Electronic Null Detector for Impedance Bridges. H. W. Lamson 4621
- Trends of Instrument Design. C. C. Mason 4644
- Relative and True Power Factors of Air Capacitors. A. V. Astin 5022
- Determination of Absolute Ohm, Using an Improved Self-Inductor. H. L. Curtis, C. Moon and C. M. Sparks 5031

C

Calculating Machines.
- Mechanical Analyser for the Solution of Secular Equations and the Calculation of Molecular Vibration Frequencies. D. P. MacDougall and E. B. Wilson, Jr. 58
- Mechanical Solution of Algebraic Equations. H. C. Hart and I. Travis 466
- Calculator for Obtaining Tristimulus Values from Spectrophotometric Data. H. W. Swank and M. G. Mellon 623
- Use of Calculating Machines in Astronomy. L. Couffignal 1498
- Calculating Devices. W. Meyer zur Capellen 3089
- Equation Solver. D. L. Herr and R. S. Graham 4791
- Mechanical Calculation of Surface Moments. F. Lorenz 4796

Calorimeters.
- Atomic Hydrogen. H. G. Poole 300
- Comparison of Specific Heats of Gases. A. Potop 753
- Semi-Microcalorimeter at Low Temperatures. D. R. Stull 756
- Microcalorimeter-Thermostat for Heat Development of Radioactive Minerals. N. v. Szentpály 757
- Molecular Heat, Heat of Fusion and Entropy of Fluorine. E. Kanada 1232
- Automatic Calorimeter for Continued Measurement of Heat Production. W. M. Barrows, Jr. and J. R. Murlin 1672
- Induction Heaters for Calorimetry below 1°K. W. F. Giauque and J. W. Stout 2079

Abstract Nos.

Calorimeters, *continued.*
  Low-Temperature Calorimeter. J. F. G. Hicks, Jr. 2924
  Diphenyl-Ether Calorimeter. T. Holmberg 2925
  Combustion Calorimeters. S. W. Lipin 2926
Cameras.
  Precision, All-Purpose Microcamera. L. C. Graton and E. B. Dane, Jr. 178
  High-Vacuum Multiplate Camera. D. A. Richards and R. A. M. Bound 179
  Measurement in Absolute Units of the Intensities of X-Ray Reflections. G. W. Brindley and F. W. Spiers 238
  Precision Powder Camera for High Temperatures. F. Schossberger 436
  New Focusing Method for X-Ray Powder Spectroscopy. L. K. Frevel 437
  Schmidt Camera. O. Struve 508
  Measurement of Line Positions on X-Ray Diffraction Films with the Aid of a Kathode-Ray Oscillograph. H. Tatel and R. Hultgren 942
  Studio Photography. A. v. Lagorio. 1617
  Optical Instruments. J. Guild 1632
  Flare in Schmidt Cameras. C. H. Smiley 2006
  Schmidt Camera 3128
  Photographic Resolving Power in the Construction of Optical Instruments. G. Hansen 3229
  Radio-Kinematography. van de Maele 3408
  Lattice Constant of Ag at High Temperature. W. Hume-Rothery and P. W. Reynolds 3466
  X-Ray Diffraction of Substances under High Pressures. R. B. Jacobs 4157
  Moseley Law X-Ray Tube for Atomic Physics Laboratories. B. Sway and D. A. Wells 4572
Capacitors.
  Relative and True Power Factors of Air Capacitors. A. V. Astin 5022
Cells, Electrolytic.
  Preparation of NaOH and H_2SO_4 by Electrolysis of Na_2SO_4. G. Grube and S. Stainoff 4659
  Reactions with Commutated D.C. at a Graphite Electrode. V. Sihvonen .. 4665
Cells, Photoelectric.
  Galena Light Detector. F. Fischer, B. Gudden and M. Treu 2196
  Photovoltaic Cells and Their Applications. W. Behrendt 3036
  Photoelectric Current Limiting Device for Insulation Measurements. E. B. Baker and H. A. Boltz 3362
  Properties of Emission Photoelectric Cell of New Design. G. A. Boutry and J. Gillod 3423
  Cu_2O Rectifiers. H. Nöldge 3807
  New "Positive" Barrier Plane Photoelectric Effect and the New Barrier Plane Photoelectric Cell. B. Kolomiez 4262
  Accuracy of Rectifier-Photoelectric Cells. J. R. Atkinson, N. R. Campbell R. H. Palmer and G. T. Winch 5079
Cells, Primary.
  Fundamental Properties of the Ideal Cell. E. Lange and K. Nagel 320
  Light High-Potential Battery. W. E. Ramsey 2579
Centrifuges.
  Quantity Heads for Air Driven Ultracentrifuge. R. W. G. Wyckoff and J. B. Lagsdin 25
  High Rotational Speeds. J. W. Beams 414
  Sedimentation Rate and Equilibrium in Centrifuges and Opaque Ultra-Centrifuges. J. W. McBain 916
  Ultracentrifuge and its Field of Research. T. Svedberg 1785
  Ultrasonic Centrifuge. P. Girard and N. Marinesco 3455
  Vacuum Type Air-Driven Centrifuge for Biophysical Research. J. W. Beams, F. W. Linke and P. Sommer 3456
Charts.
  Equal-Area Transformation of Indicator Diagram and New Aerological Chart. W. Werenskiold 4429
  Dosage Chart for X-Ray Therapy. E. H. Quimby 4710
  Psychrometric Charts. J. G. Albright 4868
Chronometers, *see* Clocks.
Clocks.
  Clocks Showing Mean Solar and Sidereal Time Simultaneously. E. Esclangon 997
  Measurement of Time. H. Spencer Jones 998

Abstract Nos.

Clocks, *continued.*
- Photoelectric Pendulum Control for Recorder Clocks. A. C. Ruge and H. E. McComb 1495
- Mechanical and Thermal Instruments. G. A. Tomlinson 1675
- Controlled 0.2-Second Pendulum. G. Turetschek 2313
- Thyratron Counter of High Counting Speed and its Development as a Recording Chronograph. F. L. Uffelmann 3205
- Elastic After-Effect. Part II. Schlötzer 3503
- New Schuler Clock. H. Gockel and M. Schuler 3560
- Quartz Clock. L. Essen 3561
- Centrifugal Carry-Over Device for Synchronous Clocks. H. Bock 3562
- New Schuler Clock. A. Scheibe 4828

Cœlostats.
- Induction Brake Control for an Astronomical Drive. C. S. Venkateswaran 3573

Coils.
- Method for Obtaining a Uniform Magnetic Field. J. W. Clark 5062

Colorimeters.
- Chromaticity Limitations of the Best Physically Realisable Three-Filter Photoelectric Colorimeter. J. A. van den Akker 621
- Objective Colorimeter for Slight Coloration and Cloudiness. H. Dreyer .. 622
- Optical Instruments. J. Guild 1632
- Trichromatic Colorimeter. M. Richter 2412
- Objective Measurement of Colour. J. W. Perry 3657

Colour Filters, *see* Filters, Optical.

Colour Mixers.
- Subjective Study of Colour Mixtures. V. H. Pavlović 153
- Simplified and Compact Tricolour Mixing Device. C. N. Warfield 4466

Comparators.
- Rapid Calibration and Correction of Comparator Screws and Photographic Production of Scales. G. R. Harrison 962
- Magnetic Comparator Metal Thickness Tester. A. B. Stevenson 2275
- Comparator for Projection of Spectra on a Screen. A. Gatterer 3744
- Physical Density Comparator. M. H. Sweet 4494

Compasses.
- Improved Inductor-Compass. R. Gunn 588
- Marsch Compass with Vortex-Flow Damping. K. Martin 1109

Compensators, Optical.
- Improved Spectroradiometric Method and Apparatus for Measuring Small Polarisation Ellipticities. L. R. Ingersoll 674
- Quartz Rotatory Compensator of High Accuracy. A. Ehringhaus 1627
- Senarmont Compensator. F. Gabler and P. Sakob 4499

Condensers, Electrostatic.
- Calibration of Decade Condensers. L. H. Ford and N.F. Astbury 2109

Conductivity, Electrical, Measuring Apparatus.
- Micro-Method for Measuring Specific Conductance. P. A. Walker 4208
- Equivalent Circuits of Conductivity Cells. S. F. Acree, E. Bennett, G. H. Gray and H. Goldberg 5036

Conductivity, Thermal, Measuring Apparatus.
- Thermal Transmission of Textiles. R. S. Cleveland 232
- Farkas Microthermal Conductivity Analysis Apparatus. H. F. Walton .. 1373
- Thermal Conductivity of Porcelain and Kieselguhr-Brick to 800° C. W. Koch 2929

Conoscopes.
- Testing Quartz Plates Cut at Right Angles to the Optical Axis. A. Biot 2440

Counters, Electron, *see also* Ionisation Chambers.
- Relative Efficiency of Tube Counters of Different Materials Under the Action of Hard γ-Rays. K. Buchmann 149
- Valve Circuit for Scaling Down Counting Rates. E. C. Stevenson and I. A. Getting 299
- Quantum-Counter Amplifiers for γ-Ray Detection. Robley D. Evans .. 362
- Production, Characteristics and Reliability of Geiger-Müller Counters. O. S. Duffendack, H. Lifschutz and M. M. Slawsky 614
- Latitude Effect in Cosmic Radiation at High Altitudes. S. A. Korff, L. F. Curtiss and A. V. Astin 640
- Latitude Effect for Cosmic-Ray Showers. H. V. Neher and W. H. Pickering 641
- Interpretation of Tube Counter Data. J. Meixner 815

Abstract Nos.

Counters, Electron, *continued.*
Radiological Applications of the Geiger-Müller Counter. C. B. Braestrup, E. J. Murphy and M. D. Whitaker 892
Efficiency of a γ-Ray Counter. G. J. Sizoo and H. Willemsen 1129
Counting Properties of Thermally Degassed Ion-Counting Tubes with Pure Hydrogen Filling. H. Egelhaaf 1274
Triode Valve Scale-of-Two Circuit. H. Lifschutz and J. L. Lawson...... 1707
Non-Ohmic Resistance for Use with Geiger-Müller Counters. G. P. S. Occhialini 1715
Simple Scale-of-Two Counter. H. Alfvén. 1966
Apparatus for Demonstrating Radioactivity. K. T. Bainbridge and J. C. Street 2402
Mains-Operated Spark-Counter. H. Greinacher 2403
High Resolving Power Tenfold Thyratron Counter. D. W. Kerst........ 2404
Multiple Coincidence Detector. S. Gorodetzky 2405
Accidental Coincidences in Counter Circuits. C. Eckart and F. R. Shonka.. 2406
Statistical Theory of a Scaling Circuit. L. Alaoglu and N. M. Smith, Jr... 2836
Operation of Tube Counters. O. Zeiller 2838
Time of Tube Counter Impulses. J. M. Lyshede and J. C. Madsen 2839
Cosmic-Ray Counter with High Resolving Power. R. Maze 2852
Stabiliser with only Two Valves for each Stage. K. E. Forsman........ 2977
Circuits for Control of Geiger-Müller Counters and for Scaling and Recording their Impulses. T. H. Johnson 3204
Thyratron Counter of High Counting Speed and its Development as a Recording Chronograph. F. L. Uffelmann 3205
Sensitivities of X-Ray Counters and Films. A. Drigo 3291
Instability of the Smallest Self-Maintained Gas Discharge; Applications to the Geiger Counter. C. van Geel and J. Kerkum 3348
New Valve Counting Circuits. H. J. Reich 3653
Improvement in Coincidence-Counting Circuit. S. Gorodetzky 3654
Transmission of Slow Electrons through Thin Collodion Films. M. Ference and R. J. Stephenson 3836
Neon Lamp as γ-Ray Counter. G. Lovera 4063
Intermittent Amplifier for Rapid Counting of Geiger-Müller Impulses. L. Kowarski and S. Winter 4064
Measurement of X-Ray Intensities with a Counter. P. Ohlin 4160
Pulse Chopper of the Geiger-Müller Counter. M. Kozodaev and G. Latyschev 4461
Dual-Range Potential Source for Field Use with Electroscopes and Geiger-Müller Counters. W. C. Bosch 4635
Recovery of Lost Radium. R. B. Taft 4719
Background Effect in Tube Counters. H. Osterwisch 4896
Counting Losses in Geiger-Müller Counter Circuits and Recorders. H. Lifschutz and O. S. Duffendack 4897
Counter Circuit for D.C. Mains. C. B. Madsen 4898

Counters, Photon.
Counter Tubes for the Visible Spectrum. K. O. Kiepenheuer 183
Solar Radiation between 2000 and 3000 Å. K. O. Kiepenheuer.......... 1078
Isochromatic Energy Curves for a Black Body in the Region 2800-3060 Å. I. L. Roich 2418
Influence of Vapours on the Spectral Sensitivity of Photon Counters. R. Audubert and J. Mattler 2437
Automatic Intensity Recorder for Photon Counters. M. Kato 4923

Cryostats.
Simple Type of Helium Cryostat. J. G. Daunt and K. Mendelssohn 2938
Thermal Expansion of Crystalline Na between 80° K. and 290° K. S. Siegel and S. L. Quimby 3304
Freezing Point of Methanol; Simple Cryostat. E. E. Roper 3767

Crystal Growth Apparatus.
Preparation of Large Single Crystals of Sodium Chloride. H. Walther 35

Current Stabilisers.
Automatic Regulation of Current in Shearer X-Ray Tube. H. le Caine 3286

Cyclotrons, *see also* Generators, H.V.
Design and Operation of a Large Cyclotron. M. C. Henderson and M. G. White 617
Effect of Fringing Flux in Large Magnets. J. D. Howe and I. Walerstein 1733
Focusing in the Cyclotron. M. E. Rose 1963

Abstract Nos.

Cyclotrons, *continued.*
- Focusing in the Cyclotron. R. R. Wilson 1964
- Magnetic Field Corrections in the Cyclotron. M. E. Rose 2393
- Measurement of R. F. Voltage in a Cyclotron. W. E. Danforth and M. B. Sampson 3352
- Upper Limit of Ion Energy Obtainable by Means of the Cyclotron. J. Khurgin 3655
- H.F. Multiple Accelerators. E. O. Schlosser 4065
- Transmutations and High Voltages. M. Pauthenier 4066
- Cyclotron and its Applications. J. Chadwick 4900
- Paths of Ions in the Cyclotron. L. H. Thomas 4901
- Present-Day Design and Technique of the Cyclotron. F. N. D. Kurie 4902

D

Dampers, *see* Vibration Apparatus.

Densitometers.
- Harvard Photoelectric Microdensitometer. G. Z. Dimitroff and D. H. Menzel 1007
- Photoelectric Densitometer. O. H. Ingber and K. Schwerin 2005
- Physical Density Comparator. M. H. Sweet 4494

Density, Measuring Apparatus.
- Density and Refractive Index of very Dilute, Aqueous Solutions of Strong Electrolytes. W. Prang 2250
- Vapour Densities of Indigo and Other Organic Compounds by Means of a Spoon Gauge. C. E. Dent and R. P. Linstead 2686
- Trends of Instrument Design. C. C. Mason 4644
- Measurement of Surface Tension and Density. E. Tyler 4820

Dialysers.
- Electrodialysis. H. de Bruyn and S. A. Troelstra 3900

Diffusion Apparatus.
- Porous Diaphragm Method of Measuring Diffusion Velocity. G. S. Hartley and D. F. Runnicles 4772

Dilatometers.
- Thermal Expansion of Rh and of Al and Mg Alloys. H. Ebert 1240
- Thermal Apparatus and Measurements. Part II. H. Moser and C. Tingwaldt 1245
- Thermal Expansion of Metals. E. Rosenbohm 2930
- Thermal Expansion of Crystalline Sodium between 80° K. and 290° K. S. Siegel and S. L. Quimby 3304

Direction Indicators.
- Ilford Screen Direction Indicator. F. J. Tritton and E. T. Wilson 1160

Discharge Tubes, Electrical.
- Behaviour of an Osglim Lamp. Part III. L. F. Richardson 291
- Scattering of He Canal Rays by He Nuclei. C. Gerthsen 295
- Excitation of Gases at Very Small Gas Pressures by Electron Collision. W. v. Meyeren 1270
- Formation of Ozone in an A.C. Low Pressure Discharge Tube. M. Senkus 1273
- Short Ion-Path H.V. Tube. W. E. Stephens and C. C. Lauritsen 1275
- Spectrum of Manganese Hydride, MnH. R. W. B. Pearse and A. G. Gaydon 1652
- Apparatus for the Purification of the Inert Gases and Hydrogen. W. Weizel 2556
- Intensity Relations of Stark Components in Hydrogen. N. Ryde 2906
- Production of Very High Energy Electrons. K. Schwarz and F. Ebster 2998
- Action of a Proton Tube. T. Franzini 4232
- Fast Neutrons. H. Reddemann 4677

Distillation Apparatus.
- Separation of F from O_2 by Adsorption and Rectification. E. Kanda 76
- Expansion of Vapours and Efficiency of Distillation. W. Świętoslawski and E. Ramotowski 267
- Ball Packings for Laboratory Rectifying Columns. A. R. Glasgow, Jr., and S. T. Schichtanz 271
- Study of Systems with Volatile Components. G. Scatchard, C. L. Raymond and H. H. Gilmann 3788

Abstract Nos.

Distillation Apparatus, *continued.*
- Plate Efficiency of Fractionating Columns. D. B. Keyes 4599
- Continuous High-Vacuum Still and Boiling-Point Apparatus. R. T. Leslie and W. W. Heuer 5002

Dosimeters, *see* Radium Dosimeters, U.V. Intensity Meters, X-Ray Dosimeters.

E

Electrocardiographs.
- Mechanical Lag-Screen Oscillograph. F. E. Hoecker and A. G. Asher 2626
- Electronic Cardiotachometer. J. W. Horton 4250
- Trends of Instrument Design. C. C. Mason 4644
- Polyelectrophysiograph. O. L. Huddleston and R. W. Whitehead 4702

Electrodes.
- New Electrode for pH Measurements. P. Nylén 844
- Potential of the *N* and 0.1 *N* Calomel Electrodes. H. T. S. Britton and G. Welford 845
- Standard Potential of the Silver-Silver Azide Electrode. A. C. Taylor and L. F. Nims 1726
- Glass Electrode for pH Measurements with Small Amounts of Solution. Y. Kauko and L. Knappsberg 2148
- Glass Electrode for Differential Titrations. M. Paić 3827
- Trends of Instrument Design. C. C. Mason 4644

Electromagnets.
- Regulator Systems for Electromagnets. H. L. Anderson, J. R. Dunning and D. P. Mitchell 887
- Applications of Intense and Extended Magnetic Fields in Recent Researches. A. Cotton 3014
- Energy Determination of Cosmic Rays by Magnetic Deflection. H. D. Rathgeber 3214

Electrometers.
- Air Potentials. K. L. Sherman 128
- Reflection of α-Particles of RaC′ by Heavy Atomic Nuclei. K. Krammer 146
- Simple Quartz-Fibre Electrometer. C. C. Lauritsen and T. Lauritsen 151
- Atmospheric Electricity at the College-Fairbanks Polar Year Station. K. L. Sherman 577
- Continuous Registration of Specific Number of Ions in the Atmosphere. H. Greinacher and W. Klein 579
- Apparatus for Demonstrating Radioactivity. K. T. Bainbridge and J. C. Street 2462
- Possibility of Improving Electrometers. E. Perucca 2612
- Stability of Zero of Valve Electrometer Circuit. F. Müller and W. Dürichen 5030

Electron Diffraction Apparatus.
- High-Vacuum Multiplate Camera. D. A. Richards and R. A. M. Bound 179
- Electron Diffraction Demonstration Apparatus. J. J. Trillat 346

Electron Mobility Apparatus.
- Specific Charge of β-Particles and of Disintegration Electrons from RaE. C. T. Zahn and A. H. Spees 2591

Electron-Optical Apparatus, *see also* Oscillographs, Kathode-Ray.
- Electron Microscopes and Telescopes. G. Gallarati and G. Madia 342
- Electron-Optical Imagery of Gas Beams by the Dark Field Method. H. Boersch 344
- Electron Mirrors. G. Hottenroth 868
- Application of the Electron Microscope in Biology. F. Krause 869
- Electron Microscope in Colloid Investigations. D. Beischer and F. Krause 870
- Electron Microscope for Studying Thermal and Secondary Electron Emission. E. Meschter 871
- Statistical Measurement of Electron Rays. K. H. Stehberger 872
- Limits of Resolving Power of the Electron Microscope. M. v. Ardenne 2160
- Theoretical Resolving Power of the Electron Microscope. R. Rebsch 2605
- Progress in Construction and Performance of Ultramicroscopes. B. v. Borries and E. Ruska 2606
- Electron Microscope for High Magnifications. A. K. Nuttall 3010
- Electron Telescope. S. Malatesta 3390
- Electron-Scan Microscope. Theoretical Fundamentals. M. v. Ardenne 4228

Abstract Nos.

Electron-Optical Apparatus, *continued.*
Short Magnetic Lens with Small Spherical Aberration. W. Glaser 4229
Simple Electron Microscopes. R. P. Johnson 4230
Present Position of the Supermicroscope. B. v. Borries and E. Ruska 4231
Electron Tube Counters, *see* Counters, Electron.
Electroscopes.
Apparatus for Demonstrating Radioactivity. K. T. Bainbridge and J. C. Street 2402
Dual-Range Potential Source for Field Use with Electroscopes and Geiger-Müller Counters. W. C. Bosch 4635
Projection Electroscope for α- and β-Rays. B. A. Spicer 4685
Electrostatic Machines, *see* Generators, H.V.
Exposure Calculators.
Nomogram and Exposure Calculator for Radiography. A. B. MacLean .. 360
Exposure Meters.
Photoelectric Control of Exposure in Photographic Printing. C. Tuttle 1161
Calibration of Photoelectric Exposure-Meters. G. Nidetzky 2434
Extensometers.
Stress-Strain Characteristics of Wool as Related to its Chemical Constitution. A. M. Sookne and M. Harris 20
Eyeglasses, *see* Spectacles.
Eyepieces.
Precision Measurements with the Micrometer Eyepiece. H. Ruhle 4332
Vision Through Optical Instruments. T. Smith 4967

F

Fathometers.
Mechanical and Thermal Instruments. G. A. Tomlinson 1675
Film Dipping Mechanism.
Automatic Dipping Mechanism for Making Built-Up Films. R. W. Mattson and S. Bernstein 1867
Films, Photographic.
Dimensional Changes in Aerial Photographic Films and Papers. R. Davis and E. J. Stovall 180
Stability of Viscose Type of Ozaphane Photographic Film. A. M. Sookne and C. G. Weber 4490
Progress in Infra-Red Technique. M. Czerny and H. Röder 4561
Filter Apparatus.
Ultra-Filters of Graduated Porosity. J. Duclaux and M. Amat 2662
Filters, Optical.
Use of Blue Filters in the Derivation of Candle-Power Standards. H. Buckley 184
Comparative Study of Violet Absorbing Filters. P. L. Bayley 619
Stellar Absorption Filter. B. Cherry 1034
Monochromatic Filters for Spectrum Lamps. H. Naumann and J. Kaltenbach 1130
Luther Condition in Colour Measurement. M. Richter 1131
Applicability of Christiansen Filters. K. v. Fragstein 1968
Monochromatic Filters for Mercury Vapour Lamps. E. M. Staats 2409
Analysis Filters in Colour Reproduction. H. D. Murray and D. A. Spencer 3225
Dark Room Filters for Use with Infra-Red Photographic Layers. M. Plotnikow 3228
Eye-Protective Glasses. W. W. Coblentz and R. Stair 3745
Spectral Transmissions of Absorbing Screens for Photometry. G. Déjardin, D. Cavassilas and R. Minangoy 4564
Filters for Theatrical Lighting. D. B. Judd 4565
Filters, X-Ray, *see* X-Ray Filters.
Flow Meters.
Pressure Multiplier for Measuring Small Velocities of Flow. P. Gmelin and R. Riedmiller 958
Effusion-Meter Jet. E. Lehrer and R. Riedmiller 959
Differential Hot Wire Gaseous Flow Meter. M. J. E. Golay 960
Marine Current Meter. M. Tenani 1076
Experimental Analysis of Rein's Thermostromuhr for Small Flows. J. F. Herrick, E. J. Baldes and F. P. Sedgwick 1746

Abstract Nos.

Flow Meters, *continued.*
  Venturi Measurements. L. Ferroglio ... 2701
  Measurements with a Half-Pitot Tube. G. I. Taylor ... 2702
  Measurements of Turbulent Fluctuations. H. Reichardt ... 3083
  Oceanographic Current Recorder. H. Dahl and O. Dahl ... 4019
  Regulating Device for a Weak Flow of Gas. J. W. Hiby ... 1474
Fluorometers.
  Fluorescence and Photodecomposition of Acetone Vapour. M. S. Matheson and W. A. Noyes, Jr. ... 4089
  Fluorometer. O. Maercks ... 4094
Fluxmeters.
  Magnetic Field Meter. R. H. Cole ... 3406
Focalographs.
  Focalograph. E. K. Reid and L. F. Black ... 3032
Freezing-Point Apparatus, *see* Melting-Point Apparatus.
Frequency Standards.
  Production of Accurate One-Second Time Intervals. W. D. George ... 4372
  Adjustable Tuning Fork Frequency Standard. O. H. Schuck ... 4618
Furnaces, Laboratory.
  Spectrum of SnF. F. A. Jenkins and G. D. Rochester ... 215
  Mechanical and Thermal Instruments. G. A. Tomlinson ... 1675
  High-Temperature Vacuum Furnace for Spectroscopic Work. K. R. More 3279
Fuses.
  Tungsten Fuses. T. Utiyama and R. Arai ... 4734

G

Galvanometers, *see also* Ammeters, Voltmeters.
  Ballistic Galvanometers in Closed Circuits. J. Gilbert ... 1339
  Electrical Control of Galvanometer Characteristics. O. H. Schmitt ... 3354
  Galvanometer Giving Logarithmic Readings. Y. le Grand ... 3815
  Photoelectric Contact-Making Galvanometer. W. L. Carson ... 3878
  Characteristic Constants of the Moving-Coil Galvanometer. L. Merz ... 4633
  Method for Obtaining a Uniform Magnetic Field. J. W. Clark ... 5062
Gas Purifiers.
  Apparatus for the Purification of the Inert Gases and Hydrogen. W. Weizel ... 2556
Gauges, Caliper.
  Size of Caliper Gauges. G. Berndt ... 55
Gauges, Pressure.
  Simple Knudsen Gauge. A. L. Hughes ... 68
  P.V.T. Properties of Nitrogen at High Density. Parts I and II. M. Benedict ... 257
  Piezoelectric Measurements in Ballistics. H. Illgen ... 474
  Dissociation Pressures of Hydrides and Deuterides of Na and K. A. Borocco ... 793
  Experimental Investigation of Thermo-Molecular Pressure Difference. S. Weber, W. H. Keesom and G. Schmidt ... 1438
  Pendulum Micromanometer. R. Masek ... 1849
  Extreme Pressures and their Importance in the Investigation of Engineering Problems. T. C. Poulter ... 2721
  Sensitive Manostat for Low Gas Pressures. T. Soller, S. Goldwasser and R. A. Beebe ... 2722
  Measurement of Pressures upon a Body Rotating in the Air. E. Brun ... 3536
  Precision Oil Manometer. T. C. Chadwick and S. Palkin ... 3537
  Sensitive Method of Temperature and Pressure Measurement. S. Zamenhof ... 3770
  Trends of Instrument Design. C. C. Mason ... 4644
  Compressibilities of H_2 and of H_2+N_2 Mixtures. R. Wiebe and V. L. Gaddy ... 4998
Gauges, Rain.
  Shielded Storage Precipitation Gauges. J. C. Alter ... 126
Gauges, Snow.
  Snow Gauge, Instrument and Method. G. Crestani ... 2374

Gelometers.

Load-Compression Characteristics of Gelatins, Fibres and Other Materials. E. J. Saxl 1384

Generators, H.V., *see also* Cyclotrons.

Neutron Tube without Pumping Device. F. M. Penning and J. H. A. Moubis 347

Nuclear Physics and Medicine. L. G. Grimmett 1752

Electrostatic Generator Operating Under High Air Pressure. D. B. Parkinson, R. G. Herb, E. J. Bernet and J. L. McKibben 2162

Transport of Ions by Current of Gas. Expansion of Gas when Ionised. M. Moreau-Hanot 2543

Transport of Ions by Current of Vapour to Obtain High Voltage. J. Virgitti 2975

Generation Conditions for Rapid Carriers with H.F. Multiple Acceleration. E. O. Schlosser 3803

Powerful H.V. Generator. A. Raskin 3842

Transmutations and High Voltages. M. Pauthenier 4066

D.C. Production at High Voltage. R. Planiol 4067

Gas Current H.V. Generators. M. Pauthenier 4203

Concrete Protection against Hard X-Rays. F. Heidenreich and R. Jaeger 4254

Dual-Range Potential Source for Field Use with Electroscopes and Geiger-Müller Counters. W. C. Bosch 4635

Self-Exciting Electrostatic Generator with Charging Bands Situated in Compressed Gas. U. Neubert 4686

γ-Ray and Neutron Generators and their Radiotherapeutic Possibilities. A. Bouwers 4718

Production of High-Energy Particles. W. H. Wells 4899

Production of Collimated Beams of Monochromatic Neutrons. L. W. Alvarez 5055

Geophones.

Design and Testing of Geophones and Their Amplifiers. E. C. Bullard and C. K. Grant 2784

Graphometers.

Kern Self-Computing Telescopic Graphometer. F. Löschner 1633

Gratings, Optical.

Improved Diffraction Patterns. M. E. Hufford 657

Method for Study of Hyperfine Structure and Width of Absorption Rays. M. Duffieux and J. Bollot 721

Central Grating for Trigonometrical Parallax of Bright Stars. E. Johansson 1004

Spectrophotometric Applications of Wood Replica Gratings. F. L. Whipple and D. Norman 2317

Microscopic Examination of Gratings with Periodic Ruling Faults. H. Siedentopf 2865

Diffraction by Irregular Gratings. R. W. Ditchburn 4916

Gravimeters, *see also* Pendulums.

Comparison of Direct and Loop Measurements with the Thyssen Gravimeter. S. v. Thyssen 3072

Error Frequency Curves as a Measure of Accuracy and their Employment with the Thyssen-Gravimeter. F. Lubiger 3073

Marine Gravimetric Methods and Surveys. M. Ewing 3074

Second-Order Disturbance (Browne) Terms in Pendulum Observations at Sea. F. A. V. Meinesz 3075

Static Gravimeter for Measurements on Land and Sea. H. Haalck 4322

Precise Measurement of 'g'. A. Guillet 4780

H

Harmonic Analysers.

Use of the Mader-Ott Harmonic Analyser. E. J. Nyström 2276

Harmonographs.

Projection Apparatus for Compounding Harmonic Vibrations. R. M. Archer 61

Heat Engines.

Reutter's Heat Engine. H. Bock 2077

Humidity Control Apparatus.

Nomogram Method of Humidity Control. R. G. Bateson 3616

Abstract Nos.

Hydrometers, *see* Density, Measuring Apparatus.

Hygrometers.
- New Psychrometer with Resistance Thermometers and Differential Crossed-Coil Measuring Apparatus. J. Möller 1556
- Hygrometry. Part II. H. Ebert 2365
- Accurate Determination of Dew Point. A. W. Hixson and G. E. White 2797
- Electric Hygrometer and its Application. F. W. Dunmore 3179
- Psychrometric Charts. J. G. Albright 4868

I

Inductance Standards.
- Primary Standard of Mutual Inductance of the National Physical Laboratory. N. F. Astbury 1336

Inductometers.
- Screened Sub-Standard Inductometer. N. F. Astbury and L. H. Ford 3027

Inductors.
- Improved Continuously Variable Self- and Mutual-Inductor. H. B. Brooks and A. B. Lewis 357
- Comparison of Coil-Magnetometer and Earth-Inductor. W. M. H. Greaves and W. M. Witchell 3188
- Determination of Absolute Ohm, Using an Improved Self-Inductor. H. L. Curtis, C. Moon and C. M. Sparks 5031

Insulation, Measuring Instruments.
- Recent Developments in Electrical Insulating Materials. L. Hartshorn 3371

Interferometers, Acoustic.
- Ultrasonic Velocity in Gases Between 1 and 100 Atmospheres. A. H. Hodge 280

Interferometers, Optical.
- Physical-Optical Instruments and Materials. F. Simeon 1175

Ionisation Chambers, *see also* Counters, Electron.
- Reflection of α-Particles of RaC′ by Heavy Atomic Nuclei. K. Krammer 146
- Cloud Chamber for Nuclear Disintegration Studies. H. R. Crane 152
- Atmospheric Electricity at the College-Fairbanks Polar Year Station. K. L. Sherman 577
- Continuous Registration of Specific Number of Ions in the Atmosphere. H. Greinacher and W. Klein 579
- Theoretical Efficiency of Cylindrical Ionisation Chambers for Estimating Radon by α-Particle Counting. J. H. J. Poole 1123
- Cosmic-Ray Recorders. A. Dauvillier 1593
- Use of an Ionisation Chamber with a Liquid Dielectric. L. Goldstein and A. Rogozinski 1965
- Radially Expanding Cloud Chamber. F. Trey 2407
- Simple Wilson Chamber for Demonstration. G. Rathenau 2408
- Valve Control Circuit for Cloud Chambers. J. R. Richardson 2837
- Automatic Wilson Cloud Chamber. K. Zuber 3206
- Absolute X-Ray Intensity Measurement. A. Drigo 3290
- Improved Ionisation Chamber for α- and H-Rays. J. Schintlmeister 4068
- γ-Ray Measurement. W. Friedrich 4255
- γ-Ray Measurement. G. W. C. Kaye and W. Binks 4256
- Be Isotope of Mass 8. O. Laaff 4450

Ionisation Detectors.
- Sensitivity of Balanced Space-Charge Positive Ion Detector. R. N. Varney 2550

Ions, Apparatus for Producing.
- Characteristics of a Strong Ion Source. G. Timoshenko 3349

K

Katharometers.
- Trends of Instrument Design. C. C. Mason 4644

Kathode-Ray Oscillographs, Tubes, *see* Oscillographs, Kathode-Ray.

Kerr Effect Apparatus.
- Electric Kerr Effect in Liquid and Gaseous CO_2. L. H. Borchert 1589

Abstract Nos.

Kinematographs.
  New Records from Electric Spark Photography. H. Schardin and W. Struth 667
  Motion-Picture Polarigraph. W. M. Cohn 2878
  Kineradiography by the Indirect Method. R. Reynolds 4252

L

Length, Measuring Apparatus, *see also* Micrometers.
  Photoelectric Methods of Metrology. L. Quevron 3943
Lenses, Electron, *see* Electron-Optical Apparatus.
Lenses, Optical.
  Distortion-Free Mounted Lenses. J. Picht 678
  Optical Paradox. M. Herzberger 1167
  Optical Paradox. H. W. Lee 3236
  Lens Testing Bench. J. L. Houghton and E. W. H. Selwyn 4932
Levelling Apparatus.
  Zeiss Invar Levelling Rods. H. Peschel 1446
  Pendulum Levelling of Astronomical Instruments. P. Lejay 1500
Levers.
  Deformation of Sensitive Levers. Berndt and W. Vogt 4784
Light Sources.
  Point Source of Continuous U.V. Spectrum. F. Almasy 644
  Absorption of CO_2 in the Region of the Band 4.3μ. C. Tingwaldt 1192
  Intensity of the Continuous Spectrum of Hydrogen. N. D. Smith 1213
  Light Source with Constant Energy in the Range of Visible Wave-Lengths. M. v. Ardenne 1599
  New Light Source for Photographic Ultramicroscopy. K. Hoffmann 2216
  Dark-Room Illumination. A. van Kreveld and J. A. M. van Liempt 2430
  Luminous Source of Great Brilliance. M. Vaudet 2860
  Electric Discharge Lamps and their Applications to Photography. N. L. Harris and H. J. A. Turner 2871
  Comparison of Intensities of Spectral Lines with a Total Radiation Source. T. N. Panay 2903
  Negative Dispersion in Electrically Excited He. M. Kruse 3238
  Production of White Light. M. Laporte 3731
  Raman Effect Apparatus. A. H. Pfund 3741
  Source of Hg Resonance Radiation of High Intensity. E. W. R. Steacie and N. W. F. Phillips 4077
  Luminescent Materials and Application to Light Sources. J. W. Ryde 4093
  Optics of Head-Lights. J. H. Nelson 4501
  Improvements in Fused-Quartz Mercury Arcs. L. B. Johnson and S. B. Webster 4515
  Progress in Infra-Red Technique. M. Czerny and H. Röder 4561
  Artificial Daylight. R. Toussaint 4904
Liquefaction Apparatus.
  Hydrogen Liquefier. J. E. Ahlberg, I. Estermann and W. O. Lundberg 272
  Apparatus for Raman Spectroscopy at Low Temperatures. G. Glockler and M. M. Renfrew 4560

M

Magnetic Balances, *see* Balances, Magnetic.
Magnetometers.
  Impedance Magnetometer. E. P. Harrison and H. Rowe 1567
  Direct Reading Apparatus for Measurement of Magnetic Field. R. Servant and B. Tsaï 2625
  Comparison of Coil-Magnetometer and Earth-Inductor. W. M. H. Greaves and W. M. Witchell 3188
  Temperature-Compensation of Unifilar Magnetometer. B. M. Janowsky 3189
  Effect of Torsion in Quartz Horizontal-Intensity Magnetometer Observations. H. H. Howe 3190
  Electromagnetic Method of Determining Induction-Coefficients of Magnetometer Magnets. J. H. Nelson 3405

Abstract Nos.

Magnetometers, ***continued.***
- Magnetometer of Rogowski. G. Giorgi 4697
- Limiting Sensitivity of an A.C. Method of Measuring Small Magnetic Moments. E. A. Johnson 4698
- Simple Magnetometer for Moderate to Very Strong Fields. A. Deubner 5063
- Portable Direct-Reading Magnetometer. G. L. Turney and G. E. Cousins 5064

Manometers, *see* Gauges, Pressure.

Mass-Spectrographs, *see* Spectrometers, Mass-.

Meggers.
- Electrical Instruments. G. F. Shotter 1290

Melting-Point Apparatus.
- Melting Point of Silicon. F. Hoffmann and A. Schulze 247
- Freezing Point Apparatus. D. Quiggle, C. O. Tongberg and E. M. Fry 766
- Thermal Apparatus and Measurements. Part II. H. Moser and C. Tingwaldt 1245

Meteorographs.
- Radio Meteorograph. H. Diamond, W. S. Hinman, Jr. and F. W. Dunmore 1936
- Atmospheric Exploration by Radio-Sounding Balloons. H. A. Thomas 3615
- Upper Air Investigations and Radio Meteorographs. R. R. Bajpai 4034
- Exploration of Atmosphere by Radio-Sonde. R. Bourgeois 4869

Micrometers, *see also* Length, Measuring Apparatus.
- Measurement of Time. H. Spencer Jones 998
- New Double-Image Astronomical Micrometer. P. Muller 1003
- Mechanical Amplification of Small Displacements. A. F. C. Pollard 1445
- Comparison Image Micrometer. C. R. Davidson and L. S. T. Symms 1499
- New Double Refractive and its Application to Double Star Measures. P. Muller 1883
- Step of Equatorial Micrometer Screw. A. Fresa 3985
- Precision Measurements with the Micrometer Eyepiece. H. Rühle 4332
- Trends of Instrument Design. C. C. Mason 4644
- Differential Pneumatic Micrometer. G. Ribaud 4787

Microphotometers, *see* Photometers.

Microscopes, Electron, *see* Electron-Optical Apparatus.

Microscopes, Optical.
- Precision, All-Purpose Microcamera. L. C. Graton and E. B. Dane, Jr. 178
- Optical Instruments. J. Guild 1632
- New Light Source for Photographic Ultramicroscopy. K. Hoffmann 2216
- Photographic Resolving Power in the Construction of Optical Instruments. G. Hansen 3229
- Polarising Microscope for Investigating Prepared Jewels. W. Maier 4927
- Vision Through Optical Instruments. T. Smith 4967

Mirrors, Electron, *see* Electron-Optical Apparatus.

Mirrors, Optical.
- Films for Interferometer Mirrors. R. A. Fisher and J. R. Platt 659
- Geometrical Theory of the Spherical Mirror. J. Flügge 676
- Mirror Systems. H. Schulz 677

Models.
- Radiographic Models. W. E. Boyd 3862
- Molecular Models of Dielectrics. L. Hartshorn 4209

Monochromators.
- Double Monochromator at Babelsberg for Testing Astrophotometric Instruments. M. Güssow 1008
- Monochromators for Purposes of Irradiation. J. W. Perry 1146
- Double Monochromator for the 0.2 to 4μ Region. C. Leiss 1222
- Grating Monochromator for Schumann Region. R. F. Baker 1664
- Constant Deviation Monochromator for Visible and U.V. Regions. R. Fortrat 2478
- Two Spectrographic Irradiators for the Visible and U.V. Regions. M. O. Pelton 2480
- Large Quartz Monochromator for Biophysical Research. F. M. Uber and S Jacobsohn 2636
- Photographic Photometry of Interference Fringes. J. Roig 4915

Musical Instruments.
- Electro-Acoustical Musical Instruments. V. Aschoff 282

N

Abstract Nos.

Neutron Generators, *see* Generators, H.V.
Nomograms.
Nomogram and Exposure Calculator for Radiography. A. B. MacLean 360
Nomogram for Radiographic Mensuration. H. J. Holmquest 4251
Nuclear Disintegration Apparatus, *see also* Cyclotrons and Generators, H.V.
Lecture Apparatus for Artificial Disintegration using Canal Rays. R. Döpel 615
L.V. Nuclear Research Apparatus. L. J. Haworth, L. D. P. King, C. T. Zahn and N. P. Heydenburg 616

O

Objectives, Optical, *see* Lenses, Optical.
Ophthalmic Apparatus.
Relation between Visual Acuity and Illumination. S. Shlaer 742
Ultra-Short Illumination of the Eye. B. Deriagin 1226
Oscillators.
Behaviour of an Osglim Lamp. Part III. L. F. Richardson 291
Two-Pulse Oscillator. I. A. Getting 365
Production and Absorption of Electromagnetic Waves from 3 cm. to 0.6 cm. in Length. N. H. Williams 366
Apparatus for Acoustic Research in the Supersonic Frequency Range. A. Noyes, Jr. and G. W. Pierce 1258
Improved Magnetostriction Oscillator. G. W. Pierce and A. Noyes, Jr. 1699
New Form of Frequency and Time Standard. L. Essen 2189
Thyratron Impulse Generator. B. G. Pressey 2638
Relaxation Oscillator with Double-Grid Valve. H. Morin 3415
Oscillator for Ultra-High Frequencies. W. L. Barrow 3416
Stable-Frequency Valve Oscillators. Y. Rocard 4258
Short-Wave Oscillator. T. V. Ionescu 4259
Production of Accurate One-Second Time Intervals. W. D. George 4372
Circuit Details for a Small Supersonic Oscillator of the Piezoelectric Type. W. C. Bosch and W. G. Allée, Jr. 4612
Oscillographs, Electromagnetic.
Mechanical Lag-Screen Oscillographs. F. E. Hoecker and A. G. Asher 2626
Trends of Instrument Design. C. C. Mason 4644
Oscillographs, Kathode-Ray.
Reflection of α-Particles of RaC′ by Heavy Atomic Nuclei. K. Krammer 146
Rapid and Accurate Measurement of Line Positions on X-Ray Diffraction Films with the Aid of a Kathode-Ray Oscillograph. H. Tatel and R. Hultgren 942
Electrical Instruments. G. F. Shotter 1290
Simultaneous Recording of Two Phenomena by Means of the Braun Tube. K. Sedlmayr 2609
Circuits Producing Sharp Electrical Impulses Free from Curvature and Their Use in Oscillographic Work. J. C. Morgan 3417
Trends of Instrument Design. C. C. Mason 4644
Ozone Tubes.
Formation of Ozone in an A.C. Low Pressure Discharge Tube. M. Senkus 1273

P

Pantographs.
Transformation Pantograph for the Reduction of Microphotometer Tracings. H. Hemmendinger 3232
Pendulums, *see also* Gravimeters.
Series of Values of 'g' about a Given Station. A. Guillet 450
Pendulum Oscillations under the Influence of Tidal and Atmospheric Forces. H. Lettau 545
Photoelectric Pendulum Control for Recorder Clocks. A. C. Ruge and H. E. McComb 1495
Pendulum Levelling of Astronomical Instruments. P. Lejay 1500
Simple Torsion Pendulum as an Accelerogram Analyser. F. Neumann 1943

Abstract Nos.

Pendulums, *continued.*
  Absolute Sound Intensity in Liquids by Spherical Torsion Pendulums. E. Klein 2107
  Development of Minor Axis in Foucault Pendulum. B. Dasannacharya 2282
  Controlled 0.2-Second Pendulum. G. Turetschek 2313
  Dissipation of Energy by a Pendulum Swinging in Air. E. C. Atkinson 3525
  Amplitude Deviation of Rate of a Pendulum. E. C. Atkinson 3526
  Variable-Length Pendulum. M. Zeuli 4341
Photoelectric Cells, *see* Cells, Photoelectric.
Photometers, *see also* Spectrophotometers.
  Telephotometer for Atmospheric Transmission. L. J. Collier and W. G. A. Taylor 570
  Intensity Curves of Light Pulses of Short Duration. J. D. Kelley 1165
  Physical-Optical Instruments and Materials. F. Simeon 1175
  Portable Photoelectric Illumination Meter. J. S. Preston 1620
  Optical Instruments. J. Guild 1632
  Measurement of Photographic Magnitudes with a Hartmann Microphotometer. H. Fischer 1882
  Submarine Photometer for Studying the Distribution of Daylight in the Sea. C. L. Utterback and P. M. Higgs 1930
  Recording Photoelectric Spectroradiometer. V. M. Albers and H. V. Knorr 2008
  Photoelectric Integrating Photometer. A. Blondel 2872
  Object-Glass Diaphragms in Photoelectric Stellar Photometry. M. Güssow 3129
  Photoelectric Photometer. R. Herz 3231
  Transformation Pantograph for the Reduction of Microphotometer Tracings. H. Hemmendinger 3232
  Microphotometer. E. E. Berkley and O. C. Woodyard.......... 4103
  Apparatus for Testing Highway Sign Reflector Units. R. Kingslake 4495
  Progress in Infra-Red Technique. M. Czerny and H. Röder 4561
  Half-Filter Method of Photographic Photometry of Stars. O. Heckmann and H. Kienle 4833
  Photometry of Projection Apparatus at Short Distances. A. Marsat and P. Cibié 4922
Piezoelectric Oscillators, *see* Oscillators.
Piezometers, *see* Gauges, Pressure.
Plates, Optical.
  Testing Quartz Plates Cut at Right Angles to the Optical Axis. A. Biot 2440
  Double-Plates for the Detection of Elliptically Polarised Light. G. Szivessy and W. Herzog 3234
  Measurement of Elliptically Polarised Light with the Calderon Double Plate. G. Szivessy and W. Herzog 4500
  Polarisation Microscopy with Bravais Double-Plates of Cellophane. H. Pfeiffer 4926
Plates, Photographic.
  Photography of Dark Hot Bodies. T. Takéuchi and T. Sugita 668
Polarimeters, *see also* Saccharimeters.
  Distortion of the Photoelastic Fringe Pattern in an Optically Unbalanced Polariscope. R. D. Mindlin 448
  Zero Position of a Polarising Nicol. J. R. Collins 2012
  Half-Shadow Polarimetry. R. Tsuchida 2874
  Motion Picture Polarigraph. W. M. Cohn 2878
Polarisers.
  Optical Properties of Polaroid for Visible Light. M. Grabau 670
  Properties and Applications of Dichroic Sheet Polarisers. S. Rösch 2876
Polarographs.
  New Polarograph and Applications. A. Schmidt 4666
Polyelectrophysiographs.
  Polyelectrophysiograph. O. L. Huddleston and R. W. Whitehead 4702
Potentiometers.
  Zero-Shunt Valve A.C. Potentiometer. J. J. Dowling 805
  Bridge Potentiometer for Comparing Electric Resistance Standards. M. Romanowski and M. Picard 2131
Pressure Gauges, *see* Gauges, Pressure.

Abstract Nos.

Prisms.
- Polarising Vertical Illuminator. L. V. Foster 2438, 2439

Projectors.
- Optical Instruments. J. Guild 1632
- Photometry of Projectors. W. M. Hampton 2436
- Photometry of Projection Apparatus at Short Distances. A. Marsat and P. Cibié 4922

Psychrometers, *see* Hygrometers.

Pumps.
- Oil Vapour Trap. P. A. Anderson 475
- Hot-Kathode Demountable X-Ray Tube and Vapour Trap. P. M. Harris 1230
- Modification of Hickman's Distillation Pump. L. Malter and N. Marcuvitz 1475
- Mechanical and Thermal Instruments. G. A. Tomlinson 1675
- Vacuum Seal. W. E. Bahls 3538
- Vacuum Relay. C. W. Miller 3539
- Simple Safety Sealing Device for High-Vacuum Pumps. K. Seiler 4346
- Liquid Flow in Tubes and Suction Pumps. G. Heinrich 4803

Pyknometers.
- Precision Pyknometric Method for Liquids and Solids. T. Batuecas and F. L. Casado 439

Pyrheliometers.
- Characteristics of Pyrheliometer with Spherical Absorber. L. F. Miller 2357

Pyrometers.
- Apparatus for Measuring Surface and Body Temperature. J. D. Hardy and G. F. Soderstrom 254
- Thermal Apparatus and Measurements. Part II. H. Moser and C. Tingwaldt 1245
- Electrical Instruments. G. F. Shotter 1290
- Photo-Thermometry. P. Neubert 1674
- Mechanical and Thermal Instruments. G. A. Tomlinson 1675
- Determination of Optical Constants by the Optical Pyrometer. A. G. Worthing 4110
- Progress in Infra-Red Technique. M. Czerny and H. Rōder 4561

R

Radio Measuring Instruments.
- Electrical Instruments. G. F. Shotter 1290

Radiometers.
- Recording Photoelectric Spectroradiometer. V. M. Albers and H. V. Knorr 2008
- Absolute Sound Intensity in Liquids by Spherical Torsion Pendulums. E. Klein 2107
- Absolute Sound Measurements in Liquids. E. Klein 4617

Radium Dosimeters, *see also* X-Ray Dosimeters.
- Model for a Radium Beam Unit for Measuring Dosage and Planning Treatments. L. G. Grimmett 2631

Radium Therapy Apparatus.
- Four-Gramme Radium Unit. H. T. Flint and C. W. Wilson 1342
- Rectangular Nozzle for Use in Radium Beam Therapy. W. H. Rann 1343
- Small Flexible 2-Gramme Radium Unit. C. W. Wilson and N. H. Pierce 1753
- Depth Doses from Teleradium Units. W. V. Mayneord and J. Honeyburne 5071
- Dosage with Radium Surface Applicators of Small Area. J. E. Roberts 5072
- Two-Gramme Radium Unit. F. L. Warburton 5073

Rain Gauges, *see* Gauges, Rain.

Rectifiers, Contact.
- Electrical Instruments. G. F. Shotter 1290
- Cu_2O Rectifiers. H. Nöldge 3807

Reflectors.
- Apparatus for Testing Highway Sign Reflector Units. R. Kingslake 4495

Refractometers.
- Physical-Optical Instruments and Materials. F. Simeon 1175
- Relative Refractive Index of Two Liquids by Photography. H. O. Kneser 3701
- Variable-Angle Liquid-Prism Spectrometer. T. V. Starkey 4152

Abstract Nos.

Relays.
Two Relays Incorporating Photoelectric Cells. A. Grace 2195
Resistance Standards.
Resistance Material "Isabellin". A. Schulze 2978
Resistors.
Electrolytic Resistors for D.C. Applications in Measuring Temperatures. D. N. Craig 3769
Ripple Apparatus.
Ripple Tank Photography. M. E. Raquet and F. R. Watson 2540
Rulers.
Curved Rulers. F. Emde 4785

S

Saccharimeters.
Optical Instruments. J. Guild 1632
Scales.
Divided Circles. W. Krug and H. Oehler 4333
Calibration of Circular Scales from Eccentricity Measurements. W. Krug 4786
Screens, Fluorescent, *see* X-Ray Screens.
Seismographs.
Experimental "Seismeter." F. A. Perret 127
Constants of Galitzin Seismograph in Presence of Reaction. J. Rybner 575
Theory of Spring Suspension of Vertical Seismograph. G. L. Schnirman 1561
Theory of Vibrography. F. Gassmann 1562
New Type of Vertical Seismograph. O. Somville 1940
Electromagnetic Seismographs. J. Coulomb and G. Grenet 1941
Piezoelectric Quartz Seismograph. E. Rothé 1942
Simple Torsion Pendulum as an Accelerogram Analyser. F. Neumann 1943
Theory of Benioff Seismograph. E. C. Bullard 2808
Kreis-Wanner Seismograph. P. L. Mercanton 4050
Simple Form of Tube Sensitometer. D. L. Edwards 3220
Slide Rules.
Integrated Intensity of Powder Photographs. E. O. Wollan 2063
Smoothing Engines.
Engine for Smoothing Small Tungsten Wires. R. P. Johnson, A. B. White and R. B. Nelson 4268
Sound Analysers.
Modified Phonodeik. J. E. Shrader 5019
Sound-Pressure Meters.
Absolute Sound Intensity in Liquids by Spherical Torsion Pendulums. E. Klein 2107
Absolute Sound Measurements in Liquids. E. Klein 4617
Spectacles.
Spectral-Transmissive Properties and Use of Coloured Eye-Protective Glasses. W. W. Coblentz and R. Stair 3745
Diving Glasses. J. Mendousse 4568
Spectral Interval Recorders.
Interval Recorder for Analysis of Spectra. G. R. Harrison 4151
Spectrographs, *see* Spectrometers.
Spectrohelioscopes.
Astronomical Spectroscopy. A. Hunter 1043
Spectrometers, Mass-.
Mass-Spectrography and Nuclear Structure. J. Mattauch 3
Mass-Spectrograph Employing the Parabola Method and Relative Abundance of Argon Isotopes. W. Schütze 4
Second-Order Focusing Mass-Spectrograph and Isotopic Weights by the Doublet Method. F. W. Aston 5
Magnetic Spectrograph Calculations. F. T. Rogers, Jr. 296
Continuous β-Spectrum of RaE. A. Flammersfeld 609
Mass-Spectrograph of High Intensity and Separation of Rb Isotopes. W. Walcher 1763
Mass-Spectrometer with Improved Focusing Properties. W. Bleakney and J. A. Hipple, Jr. 1769

Abstract Nos.

Spectrometers, Mass-, *continued.*
- Electron-Optical Theory of Precision Mass-Spectrographs. R. Herzog and V. Hauk 2551
- Increase of Resolving Power of Mass-Spectrographs. R. Herzog and V. Hauk 3350
- Separation of Isotopes for Investigation of Nuclear Transformations. E. L. Yates 4273
- General Theory of Double Focusing Mass-Spectrographs. R. Herzog and V. Hauk 5026

Spectrometers, Optical.
- Dispersion without Deviation of the Mean Ray. H. W. Farwell 196
- Device for Examination of Line Spectrograms. G. Bolla 230
- Study of Absorption Spectra by Means of Hartley Figures. C. Dufraisse and J. Houpillart 231
- Slit Spectrograph for Diffuse Galactic Nebulae. O. Struve 508
- Method for Study of Hyperfine Structure and Width of Absorption Rays. M. Duffieux and J. Bollot 721
- Large-Aperture Spectrographs Constructed at the Optical Institute, Leningrad. G. Sljusarev and V. Chernjajev 731
- New Infra-Red Spectrograph with a Novel Method for Registering the Heat Radiation. E. Lehrer 733
- Performance of Rotatory Spectrograph. Y. Öhman 1005
- Design and Operation of Harvard-M.I.T. 1936 Eclipse Equipment. D. H. Menzel, J. C. Boyce, H. Hemmendinger, R. d'E. Atkinson and W. R. Brode 1006
- Astronomical Spectroscopy. A. Hunter 1043
- U.V. Dispersion Measurements. V. Holbro 1168
- Physical-Optical Instruments and Materials. F. Simeon 1175
- Vacuum Spectroscopy. R. W. B. Pearse 1223
- Far Infra-Red Spectroscopy. H. M. Randall 2018
- Automatic Prism Spectrometer for the Infra-Red. H. Gershinowitz and E. B. Wilson, Jr. 2052
- Automatic Photography of Raman Spectra of Liquid Mixtures. A. Andant 2477
- Vacuum Spectrograph. B. K. Johnson 2479
- Two Spectrographic Irradiators for the Visible and U.V. Regions. M. O. Pelton 2480
- Molecular Association Studied in the Infra-Red. J. Errera and H. Sack 2655
- Nebular Spectrograph of the McDonald Observatory. O. Struve, G. van Biesbroeck and C. T. Elvey 2749
- Infra-Red Prism Spectroscopy. R. B. Barnes 2882
- Spring-Suspended and Thermostated Littrow Spectrograph. N. A. Kent and R. G. Lacount 3280
- Tolerances Permissible in Flats for Autocollimation Tests. C. R. Burch 3572
- Raman Effect Apparatus. A. H. Pfund 3741
- Two-Prism Spectrograph for Studying U.V. Sources of Radiation and Photographic Emulsions. P. Gesteau 3742
- Wire-Grating Spectrometer for Far Infra-Red. P. Barchewitz and M. Parodi 3743
- Comparator for Projection of Spectra on a Screen. A. Gatterer 3744
- Image-Slicer for Reducing Loss of Light at Slit of Stellar Spectrograph. I. S. Bowen 3986
- Variable-Angle Liquid-Prism Spectrometer. T. V. Starkey 4152
- Raman Spectroscopy at Low Temperatures. G. Glockler and M. M. Renfrew 4560
- U.V. Absorption Spectra by Reflection. T. Guilmart and R. Freymann 4949

Spectrometers, X-Ray.
- Curved Quartz Crystal X-Ray Spectrograph. B. B. Watson 751
- Low-Temperature X-Ray Spectrograph. A. Goetz 1231
- X-Ray Photography of Reciprocal Lattice Planes. W. F. de Jong and J. Bouman 1800
- Suggestion for Development of Double-Crystal X-Ray Spectrometer. M. Renninger 2923
- Technique of X-Ray Spectral Analysis. P. Brauer 4156
- Concave-Grating Vacuum Spectrograph for Wave-Lengths 15 to 1000 Å. F. C. Chalklin, S. S. Watts and S. P. Hillson 4975

Abstract Nos.

Spectrophotometers, *see also* Photometers.
- Photoelectric Transmission Spectrophotometer for the Measurement of Photosensitive Solutions. S. Shlaer 732
- Short-Wave Ultra-Violet Photoelectric Spectrophotometer of High Accuracy. W. Deck 1665
- Conversion of Polarisation Spectrophotometric Readings. L. Honty 2879
- Direct Intensity Registration in Spectrophotometry. M. Minnaert and J. Houtgast 3245
- Photoelectric Spectrophotometers. R. H. Sewig 3740
- G.E.C. Recording Spectrophotometer. J. L. Michaelson 4965
- Calibration and Operation of the G.E.C. Recording Spectrophotometer. K. S. Gibson and H. J. Keegan 4966

Spectroscopes, *see* Spectrometers.

Speedometers.
- Electronic Circuits for Measurement of Time and Speed. H. J. Reich and H. Toomim 501
- Electrical Instruments. G. F. Shotter 1290

Spherometers.
- Radii of Curvature. K. Giesebart 3941
- Optical Spherometer for Non-Reflecting Surfaces. C. S. Venkateswaran 4334

Stress-Strain Analysis.
- Standard Discs in Strain Testing of Glassware. E. J. Gooding 4778

Stroboscopes.
- Subjective Study of Colour Mixtures. V. H. Pavlović 153
- Adjustable Tuning-Fork Frequency Standard. O. H. Schuk 4618
- Theory of Chromatic Stroboscope. R. W. Young and A. Loomis 5017

Surface Tension, Measuring Apparatus.
- Inexpensive Surface Tensiometer. H. N. Holmes 4370
- Measurement of Surface Tension and Density. E. Tyler 4820

Suspensions.
- Axial Magnetic Suspensions. F. T. Holmes 358

T

Taps.
- Lubrication of Taps with Phosphoric Acids. D. L. Chapman and L. A. Moignard 500

Telescopes.
- Northumberland Telescope at Cambridge Observatory. F. J. Hargreaves 506
- Building the 200-inch Telescope. C. S. McDowell 507
- Astronomical Spectroscopy. A. Hunter 1043
- Photographic Resolving Power in the Construction of Optical Instruments. G. Hansen 3229
- Induction Brake Control for an Astronomical Drive. C. S. Venkateswaran 3573
- Step of Equatorial Micrometer Screw. A. Fresa 3985
- Luminosity of Telescope Images. V. Ronchi 4508
- Position of the Exit Pupil of Telescopes. C. v. Hofe 4509
- Dioptrics of Aiming Telescope. M. Schulz 4928
- Vision Through Optical Instruments. T. Smith 4967

Theodolites.
- Theodolite Fitted with a Shutter Eyepiece. J. de G. Hunter 2783
- Tests of Small Surveying Theodolites with Helical Gearing and Measuring Spindle. K. Lüdemann 4018
- Short-Period Fractional Error of a Coincidence Theodolite. H. Kasper 4851
- Pilot Balloon Theodolite. R. Cranna 4870

Thermocouples.
- Absolute A.C. Measurements and Calibration of Thermocouples up to 500 Mc./sec. M. J. O. Strutt and K. S. Knol 2129

Thermometers.
- Measurements of Liquid Helium Temperatures. Parts I and II. G. Schmidt and W. H. Keesom 252
- Apparatus for Measuring Surface and Body Temperature. J. D. Hardy and G. F. Soderstrom 254
- Quartz Mercury Thermometer. H. Moreau 768

Abstract Nos.

Thermometers, *continued.*
Thermal Apparatus and Measurements. Part II. H. Moser and C. Tingwaldt 1245
Reutter's Heat Engine. H. Bock 2077
Phosphor-Bronze Resistance Thermometers for Liquid He Temperatures Suitable for Use in Strong Magnetic Fields. P. H. van Laer and W. H. Keesom 2936
Amorphous Carbon Resistance-Thermometer Heaters at Low Temperatures. W. F. Giauque, J. W. Stout and C. W. Clark 2937
Phosphor-Bronze Resistance Thermometers for Temperatures below 1°K., and Carbon and Ink Thermometers for Use in High Magnetic Fields between 1° and 4°K. H. van Dijk, W. H. Keesom and J. P. Steller 3308
Electrolytic Resistors for D.C. Applications in Measuring Temperatures. D. N. Craig 3769
Sensitive Method of Temperature and Pressure Measurement. S. Zamenhof 3770
Gas Thermometer for Very Low Temperatures. A. H. Woodcock 4167
Katabatic Winds and Prevention of Frost Damage. C. E. Cornford 4428

Thermopiles.
Radiation Thermopiles. A. H. Pfund 253

Thermostats.
Microcalorimeter-Thermostat for Heat Development of Radioactive Minerals. N. v. Szentpály 757
Mechanical and Thermal Instruments. G. A. Tomlinson 1675
Thermoregulator for Experiments of Long Duration. N. Sălăgeanu 2076
Thyratron-Controlled Thermostat. J. M. Sturtevant 4584

Thermostromuhrs.
Experimental Analysis of Rein's Thermostromuhr for Small Flows. J. F. Herrick, E. J. Baldes and F. P. Sedgwick 1746

Thyratrons.
Electrical Instruments. G. F. Shotter 1290

Time Broadcasters.
Production of Accurate One-Second Time Intervals. W. D. George 4372

Timing Instruments, *see also* Clocks.
Electronic Circuits for Measurement of Time and Speed. H. J. Reich and H. Toomim 501

Transformers.
Electrical Instruments. G. F. Shotter 1290

Tuning Forks.
Adjustable Tuning Fork Frequency Standard. O. H. Schuck 4618

U

Ultracentrifuges, *see* Centrifuges.
Ultramicroscopes, *see* Microscopes, Optical, *and* Electron-Optical Apparatus.
Ultra-Violet Intensity Meters, *see also* Actinometers.
U.V. Measurement of Natural and Artificial Sources of Radiation with the U.V. Dosimeter. W. Frankenburger and H. Hammerschmid 2627
Tests of Quartz Test Tubes of the Bioclimatic U.V. Dosimeter. L. W. Pollak and F. Fuchs 2628

V

Vacuum Gauges, *see* Gauges, Pressure.
Vacuum Pumps, *see* Pumps.
Vapour-Pressure Apparatus.
Effect of Intermolecular Forces in Gases and Liquids. E. Steurer and K. L. Wolf 2524

Vibration Apparatus.
Theory of Vibrography. F. Gassmann 1562
Dynamic Damper for Seismic Structural Vibration. K. Kanai 2375
Trends of Instrument Design. C. C. Mason 4644

Abstract Nos.

Viscometers.
Viscosity of Fluorine Gas at Low Temperatures. E. Kanda 91
Overflow Viscometer. I. Sakurada and N. Saito 95
Vibration Viscometry. R. Auerbach 1001
Capillary-Type Viscometer. P. E. Raaschou 1002
Viscosity of Slag Systems. J. R. Rait and R. Hay 1877
Thermodynamic Properties of the Hexyl Alcohols. F. Hovorka, H. P. Lankelma and S. C. Stanford 2519
Influence of Surface Tension on Viscosity Measurement. Viscosity of Methanol. G. Jones and H. J. Fornwalt 3566
Viscosity of Liquid He. W. H. Keesom and G. E. Macwood 3568

Voltage Regulators.
Valve Circuit for Scaling Down Counting Rates. E. C. Stevenson and I. A. Getting 299
D.C. Mains Voltage Stabiliser. R. J. Hercock 2134
Stabiliser with only Two Valves for each Stage. K. E. Forsman 2977
Dual-Range Potential Source for Field Use with Electroscopes and Geiger-Müller Counters. W. C. Bosch 4635

Voltmeters.
E.H.F. Electrostatic Voltmeter. F. E. J. Ockenden 301
Two-Valve Voltmeter. W. C. Michels 824
Apparatus for Acoustic Research in the Supersonic Frequency Range. A. Noyes, Jr. and G. W. Pierce 1258
Electronic Voltmeter with Logarithmic Scale. M. Nuovo 1278
Null Methods of Calibrating Sensitive A.C. Instruments. W. Hohle and W. Rump 2108
Inverse Valve Voltmeter. O. H. Schmitt 2128
Improved Circuit for the D.C. Amplifying Valve of a Valve Voltmeter. R. E. Burgess 2559
Measurement of R.F. Voltage in a Cyclotron. W. E. Danforth and M. B. Sampson 3352
Potentiometric Measurement of Extremely Small Voltages. I. Amdur and H. Pearlman 3353
Thermionic Voltmeter with a Linear Law. D. G. Reid 3805
Push-Pull-Stabilised Triode Voltmeter. C. Williamson and J. Nagy 4631
Direct-Voltage Amplifier. E. L. E. Wheatcroft 4634
Trends of Instrument Design. C. C. Mason 4644
Stability of Zero of Valve-Electrometer Circuit. F. Müller and W. Dürichen 5030

W

Wattmeters.
Electrical Instruments. G. F. Shotter 1290
Trends of Instrument Design. C. C. Mason 4644
Wave-Length Standards, *see* Frequency Standards.
Wave-Motion Demonstration Apparatus.
Apparatus for Wave Theory Demonstrations. H. Greinacher 658
Wind Tunnels.
Non-Static Problems in Hydrodynamics. G. Krall 3506

X

X-Ray Cameras, *see* Cameras.
X-Ray Dosimeters.
Dosage Chart for X-Ray Therapy. E. H. Quimby 4710
X-Ray Filters.
Collodion Filter for Cr Kα-Radiation. S. S. Sidhu 748
X-Ray Kinematograph Apparatus.
Kineradiography by the Indirect Method. R. Reynolds 4252
X-Ray Kymographs.
Construction of an Inexpensive X-Ray Kymograph. C. McNeill 3409

Abstract Nos.

X-Ray Micro-Analysers.
X-Ray Micro-Analyser. L. v. Hámos 1670

X-Ray Screens.
Metallic Intensifying Screens. H. E. Seemann 888
Use of Intensifying Screens in X-Ray Diffraction Work. C. Gamertsfelder and N. S. Gingrich 2489
Sharpness Index of X-Ray Intensifying Screens. H. Nitka 3407

X-Ray Spectrometers, *see* Spectrometers, X-Ray.

X-Ray Tomographic Apparatus.
Laminagraph and Its Variations. J. Kieffer 2635
Tomography. G. B. Bush 4705

X-Ray Tubes.
X-Rays from Radio Valves. H. D. Simons, G. L. Clark and O. C. Klein 745
Condenser Discharge X-Ray Tube. K. H. Kingdon and H. E. Tanis, Jr. 894
Hot-Kathode Demountable X-Ray Tube and Vapour Trap. P. M. Harris 1230
Simultaneous Cross-Radiation. M. A. Loebell 1747
X-Ray and Electrical Protection with Reference to X-Ray Tubes. M. J. Gross 1748
Short-Wave X-Rays. W. D. Coolidge 3031
Focalograph. E. K. Reid and L. F. Black 3032
Automatic Regulation of Current in Shearer X-Ray Tube. H. le Caine 3286
X-Ray Tube for Crystal Analysis and Stress Measurements. J. E. de Graaf and W. J. Oosterkamp 4155
Concrete Protection against Hard X-Rays. F. Heidenreich and R. Jaeger 4254
Moseley Law X-Ray Tube for Atomic Physics Laboratories. B. Sway and D. A. Wells 4572
Development of H.V. X-Ray Tubes. C. C. Lauritsen 4715
Breakdown in X-Ray Tubes. N. C. Cordingly 4716

AUTHOR INDEX.

[*The numbers refer to Abstracts. A star* (*) *indicates remarks in a discussion.*]

Aalts, T. R., colloidal electrolytes, 312
Abadie, P., chemical affinity, 403; dipole rotation, 5038
Abel, E., normal potential of D_2, 2149
Abetti, G., solar chromosphere, 3598
Acree, S. F., conductivity cells, 5036
Adam, H., electron pair production in Pb, 333
Adam, M. G., Fraunhofer lines, 1070; solar spectrum, 3162
Adam, N. K., lubrication, 1868; surface tension of paraffin chain salts, 2736
Adamczewski, I., mobility of ions in dielectrics, 321, 2990, 2991
Adams, E. P., electric distribution on cylinders, 348, 825, 873; two-dimensional "ice-pail," 874
Adams, E. Q., radiation of Hg arc, 2116, 2117
Adams, N. I., Jr., disintegration of Th, 4447; electrical oscillations of spheroid, 3034
Adams, W. S., spectra of early-type stars, 1516
Addison, C. C., detergent solutions, 2305
Adel, A., atmospheric absorption band, 1554; infra-red telluric spectrum, 4013, 4014, 4015
Adenstedt, H., conductivity of pure metals, 2615
d'Adhémar, R., projectiles, 1461
Adler, F., Stern-Gerlach experiment, 854
Afanasjeva, A., secondary emission, 3006
Agostinelli, C., corpuscle in magnetic-field, 4224
Ahearn, A. J., thoriated W., 4731
Ahlberg, J. E., hydrogen liquefier, 272
Ahmad, R., structure of phloroglucine dihydrate, 4300
Aikawa, K., electrokinetic potential, 3052
Aimond, F., convex surfaces, 59
Airey, J. R., radiation integrals, 964
Aitken, R. G., double stars, 1066
Akamatu, H., oiliness, 1872; thixotropy, 3448
Åkerlöf, G., density of HCl solutions, 2687
van den Akker, J. A., colorimeter, 621
Alaoglu, L., scaling circuit, 2836
Albers, V. M., spectroradiometer, 2008
Albert, O., surface tension, 4821
Albertson, W., IrI spectrum, 3704
Albertson, W. E., CeII spectrum, 691
d'Albon, G., permeability of iron layers, 1326
Albright, J. G., psychrometric charts, 4868
Albright, P. S., salting-out theories, 70
Aldrich, E. W., gasoline-alcohol mixtures, 484, 485
Alexander, W. A., decomposition of ethane, 4917
Alexeeva, K., radioactive Ag, Cs and In, 3636; radioactive Sb, 603
Alexopoulos, K., X-ray scattering, 4969
Alfvén, H., cosmic rays, 631, 1136, 3663; scale-of-two-counter, 1966
Alichanian, A., β-spectrum of RaE, 4458; β-spectrum of ThC, 4459; electron pairs, 4460
Alichanian, A. I., β-spectra, 1577, 1578
Alichanov, A., β-spectrum of RaE, 4458
Aliverti, G., atmospheric radioactivity, 2821
Allais, M. L., K-spectra of As, Se and Br, 4573; L-spectra of Th, 1229
Allan, G. E., sound velocity in Cu, 4607
Allée, W. G., Jr., supersonic oscillator, 4612
Allegretti, L., anomalous dispersion, 680
Allen, C. W., solar spectrum, 4012
Allen, J. F., surface tension of He, 2302; thermal equilibrium below 1° Abs., 2507
Allen, M., resistance of Sn single crystals, 826
Allen, W. D., spreading of drops, 493
Aller, L. H., u.v. stellar space, 526, 4385, 4836
Allibone, T. E., spark discharge, 2544
Allison, S. K., disintegration of Be, 3642
Allmand, A. J., photochemical union of H_2 and Cl_2, 1156
Allsopp, C. B., dispersion, 189, 197
Almasy, F., continuous u.v. source, 644
Almy, G. M., CsH spectrum, 2896
Alter, J. C., precipitation gauges, 126
Alterthum, H., clean-up of inert gases, 2555; positive column, 1269
Altma, A., magnetically orientated Bi, 4243
Alvarez, L. W., electron capture, 4456; monochromatic neutrons, 5055
Amat, M., ultra-filters, 2662
Ambarzumian, V. A., diffuse nebulæ, 4387
Amdur, I., small voltage measurement, 3353
Amiel, J., paramagnetic complexes, 2623

Amiot, O., u.v. absorption of CS_2, 1205
Amor, A. E., motion-picture films, 3224
van Amstel, J. J. A. P., metal surfaces, 1864
Amy, L., optical properties of suspensions, 4462
Ananjeva, L. N., u.v. energy distribution, 693
Ananthakrishnan, R., Raman spectrum of CCl_4, 2472
Andant, A., Raman spectra of liquid mixtures, 2477
Anderson, H. L., regulators for electromagnets, 887
Anderson, J. S., phthalocyanine spectra, 4133
Anderson, J. T., luminescent materials, 4093*
Anderson, L. C., Raman spectra of CH_3OH, 229
Anderson, L. H., OsO_4 in CCl_4, 3966
Anderson, P. A., contact p.d. between Ba and Mg, 5058; vapour trap, 475
Anderson, T. F., film balances, 89; Raman spectrum of BF_3, 3738; Raman spectrum of B_2H_6, 4558
Andrade, E. N. da C., viscosity of liquids, 90
Andrews, J. P., thermal diffusivity of soil, 2793
Andrews, L. V., conductances of KCl solutions, 2568
Andrissi, G. L., comet 1936 a (Peltier), 1502
Angenetter, H., canal rays, 2461
v. Angerer, E., colorimetry of dark surfaces, 4467
Angus, W. R., frequency of N-S link, 3278
Antonov-Romanovskij, V., phosphorescence of ZnS, 650
Antoun, H., simultaneous radio transmission and reception, 2639
Antweiler, H. J., diffusion layer in electrodeposition, 4661; Hg kathodes, 4222
Aoki, H., D-D neutrons, 4675; disintegration of C, 4884
Aoyama, S., action of substances on photographic plates, 3219
Appleton, E. V., ionosphere, 1348
Arai, R., tungsten fuses, 4734
Arakawa, H., atmospheric electric field, 576; atmospheric height and energy, 1080; atmospheric interchange, 4036; land and sea breezes, 566
Araki, G., X-ray spin-doublets, 4972
Archenhold, G., halo phenomena, 4046
Archer, C. T., heat conduction in $H_2 + D_2$, 2069
Archer, R. M., harmonograph, 61
Archibald, W. J., diffusion in field of force, 2254, 3919; hypergeometric functions, 3952
Arcimovič, L. A., energy loss of electrons, 3835
v. Ardenne, M., constant light source, 1599; electron microscope, 2160, 4228
Arditi, M., electric moments, 2741
Ariyama, K., electronic states of metals, 2127
Armand, H., emission of α-particles, 1959
Armbruster, M. H., adsorption of gases on mica, 1481
Armellini, G., cosmogony, 1016
Arnot, F. L., Hg_2-formation, 910; He_2 formation, 2656; negative-ion formation, 4628
Arnoult, R., active deposit of Tn, 1576; β-ray absorption, 2833; β-ray spectrum of ThB, 1126
Arnulf, A., atmospheric O_3, 117, 556, 557
Arrhenius, S., dielectric properties of carbohaemoglobins, 3821
Årstad, O., Cr-As system, 1397; Mn-P system, 930
Artigas, F., radiation by plants, 2834
Arts, J., bells, 2527
Aschoff, V., electro-acoustical instruments, 282
Asher, A. G., oscillograph, 2626
Asmus, E., viscosity of electrolytes, 1876
Astapowitsch, I. S., meteors, 97
Astbury, N. F., a.c. networks, 4619; calibration of condensers, 2109; capacitance, 1721; inductometer, 3027; mutual inductance standard, 1336; resistance measurement, 1280
Astbury, W. T., structure of proteins, 1392
Astin, A. V., cosmic rays, 640, 642; power factors of air capacitors, 5022
Aston, F. W., isotope separation, 3884; mass-spectrograph, 5; report of Committee on Atoms, 394
Aston, J. G., entropy of acetone, 3785; entropy of alcohol, 3784
Asundi, R. K., CCl_4 spectrum, 1204; $SiBr_4$ spectrum, 698; $SiCl_2$ and $SnCl_2$ bands, 2897
Athavale, V. T., refraction of oils and fats, 4506
Atkins, W. R. G., daylight variations, 1935
Atkinson, E. C., pendulum, 3525, 3526
Atkinson, J. R., rectifier photo-cells, 5079
Atkinson, R. d'E., eclipse equipment, 1006
Auclair, M., anode rays, 1271
Audubert, R., decomposition of NaN_3, 2040; photon counters, 2437
Auerbach, R., vibration viscometry, 1001
Auger, P., cosmic rays, 1140, 3212, 4083
Aunis, G., law of combustion, 3314
Austin, J. B., adsorption of gases on mica, 1481
Autenrieth, H., electrolytic oxidation of Rh, 2586
Auvillain, R., colour photography, 177

Auwärter, M., metal films 4369; optical constants of Rh, 675
v. Auwers, O., magnetic binding, 3017; magnetic neutral solutions, 4692
Avery, W. H., infra-red and Raman spectra, 4944, 4945
Avramenko, L., OH absorption bands, 211
Avrami, M., crystal structure from X-ray data, 3460
Avsec, D., convection in air, 1238
Awbery, J. H., latent heat of fusion of Al, 4981; thermodynamics, 1250
Ayre, R. S., vibrations in buildings, 2806
d'Azambuja, L., solar prominences, 1923
d'Azambuja, (Mme), solar prominences, 1923
Aziz, S. A., Raman spectrum of diphenyl, 4555

Baade, W., supernovae, 4406, 4847
Babbitt, J. D., heat conduction in fibreboard, 2928
Bach, N., Pt sols, 918
Bacher, R. F., hyperfine structure of In, 4520
Badarau, G., nuclear theory, 3432
Badareu, E., explosion potential, 3798, 4192
Badger, R. M., infra-red band envelopes, 4959
Bär, R., supersonic dispersion, 5012; transmission of h.f. sound, 4186
Bär, W., anode glow, 3345; glow discharge, 816, 817, 2969
Bagnold, R. A., sand dunes, 4031; sand storms, 3605; size-grading of sand, 116
Bahls, W. E., vacuum seal, 3538
Bailey, C. R., $COCl_2$ spectrum, 710; H_2O_2 spectrum, 4125; structures of CF_4 and SiF_4, 3891
Bailey, G. L. J., surface structure of Hg, 83
Bailey, V. A., differential equations, 3086; electric wave propagation, 5076; interaction of radio waves, 4727
Bainbridge, K. T., demonstrating radioactivity, 2402
Baize, P., orbits of binary stars, 2775
Bajpai, R. R., ionosphere, 3872; radio meteorographs, 4034; reflection of radio waves, 2640
Baker, C. J. W., magnetic properties of Hg, 2177
Baker, E. A., variable stars, 530
Baker, E. B., measurements, 3362
Baker, J. G., β-Lyrae, 1056; gaseous nebulae, 3137, 4385, 4836; solar reversing layer, 1535
Baker, R. F., monochromator, 1664
Baker, R. H., catalogue of galaxies, 1922
Baker, W. O., molecular rotation, 2987
Balaschowa, N. A., Pt sols, 918
Baldes, E. J., thermostromuhr, 1746
Baldinger, E., D-D reaction, 2824
Baldwin, R. B., λ Cassiopeiae, 2768
Baldwin, W. C. G., rotatory dispersion, 4106
Balin, G. P., broadening of Hg Line, 2536·7 Å, 2021
Balz, G., Al-Mg alloys, 3239
Bancroft, D., susceptibility of Rochelle salt, 2142
Bancroft, W. D., concentration cells, 3374; Grotthus and Einstein, 660
Bandow, F., adsorption of porphyrins, 2466
Banerjee, K., space-group of creatinine, 3482; structure of benzil, 1406; structure of benzophenone, 3060; structure of phloroglucine dihydrate, 4300
Banerjee, S., susceptibility of $MnCO_3$, 4245
Banerjee, S. S., electrical constants of soil, 2792
Banerji, S. K., earth's charge, 2382; Indian earthquakes, 3182
Bangham, D. H., adsorption on mica, 1858, 1859, 2731; swelling of charcoal, 2733
Bapat, R. N., Raman spectra of silicates, 4149; structure of aliphatic amines, 4280
Barber, A., scattering of β-particles, 4673
Barber, D. R., Comet Finsler (1937 f), 3131; Nova Lacertae, 529
Barbier, D., auroral zone, 1093
Bârcă-Gălăteanu, D., infra-red absorption of hydrocarbons, 2037
Barchewitz, B., CH bands of benzene derivatives, 2035
Barchewitz, P., CH absorption bands, 705; spectrometer, 3743
Bardeen, J., alkali metals, 3068, 3069
Bardet, J., elements in sea water, 1540
Bardhan, U. C., nuclear structure, 2820
Barker, E. F., spectra of CH_3OD and CH_2DOD, 4526; spectrum of CH_3OH, 4525;
Barlow, E. W., aurora, 2371
Barnes, B. T., heterochromatic photometry, 3693; radiation of Hg arc, 2116, 2117
Barnes, R. B., infra-red spectroscopy, 2882
Barnes, S. W., induced radioactivity, 1951
Barnes, W. H., structure of $Rb_2S_2O_6$, 2678
Baroni, A., polymorphism of MnSe, 3473
Barr, E. S., absorption of water at 4·7μ, 2840
Barr, G., viscosity of oils, 1874
Barreca, P., diffraction equation, 656
Barrer, R. M., sorption by zeolites, 3973
Barrow, W. L., h.f. oscillator, 3416
Barrows, W. M., Jr., calorimeter, 1672
Barschauskas, K., cosmic rays, 635
Bartell, F. E., activated Cl, 4358
Bartels, J., lunar almanac, 3140; magnetic storm, 2816; terrestrial magtism, 3187

Barth, H., mitogenetic radiation, 1754
Bartholomé, E., CD_4 transformations, 2949; molecular vibrations in D compounds, 718; vibrations of ethane, 2031
Bary, P., density of glass, 4768
Baryšanskaja, F. S., fluorescence in layers, 647, 4091
Baschwitz, A., continuous β-spectrum, 2831; intensities of radioactive elements, 2389
Bassière, M., structure of NaNCO, 2677
Batchelor, H. W., silica jellies, 3051
Bate, A. E., whispering gallery, 1263
Bateman, H., lift and drag functions, 3081; Rayleigh waves, 4438
Bates, J. B., ferrocyanide gels, 4752
Bates, L. F., magnetic properties of Hg, 2177
Bates, O. K., heat conduction in liquids, 3299
Bateson, R. G., humidity control, 3616
Battista, M., infra-red absorption of organic liquids, 700
Batuecas, T., densities of NaCl and KCl solutions, 3487; pyknometric method, 439
Baudouin, A., nerve currents, 5065
Bauer, E., molecules in condensed phases, 4278; vibration spectra of condensed molecules, 4141
Bauer, G., properties of oxide films, 836
Bauer, S. H., energy states in solids, 3780; structure of B_4H_{10} and B_5H_{11}, 2209; structures of B_2NH_7 and $B_3N_3H_6$, 1768
Baum, A., adsorption of chain molecules, 3116
Baumgardt, E., elasticity of crystals, 4180; piezoelectric oscillations, 3879; supersonics, 3333, 4608; transparency to h.f. sound, 2958
Bawn, C. E. H., free radicals, 2212; trimethylene biradical, 2213
Baxter, G. P., atomic weight of Pb, 909; atomic weights, 2214
Bayen, M., refractivity of D_2O, 3237; u.v. dispersion of water, 2881
Bayley, P. L., violet filters, 619
Bažulin, P., absorption of h.f. sound, 3793
Beach, J. Y., dipole moments, 4645; rotation in $C_2H_4Cl_2$, 4646; structures of butane derivatives, 1379; structures of ketene and thiophosphoryl chloride, 906; structures of P and Si compounds, 3889; thermodynamic functions, 784
Beal, J. L., electrolysis of perchlorates, 1723
Beals, C. S., interstellar absorption line, 2333; interstellar Na, 2767; Nova Lacertæ, 1914
Beams, J. W., centrifuge, 3456; high rotational speeds, 414
Bearden, J. A., determination of e/m, 5050
Beattie, J. A., ice point and triple point of water, 2075
Beboutoff, M., stable dynamical systems, 1459
Beck, G., energy of electron, 4798
Becker, A., action of kathode rays on Se cells, 379; corpuscular rays, 2552
Becker, J. A., thoriated W, 4731
Becker, R., mixed crystals, 2238
Becker, W., coloration of faint stars, 2347; colour temperature of stars, 102; δ Cephei, 3589
Beckett, C., negative-ion formation, 4628
Beckmann, C. O., solvent action on rotatory power, 1626
Becquerel, J., magnetic rotation, 4073
Bedeau, F., valve amplifier, 2132
Bedel, C., solubility of Ag salts, 4813
Bednarczyk, W., u.v. absorption by organic substances, 223
Beebe, R. A., manostat, 2722
Beer, A., Super-Nova 145·1937 Persei, 1531
Beevers, C. A., crystal structure factors, 926
Behrendt, W., photovoltaic cells, 3036
Beij, K. H., flow in pipes, 3516
Beischer, D., electron microscope, 870; smokes, 2665
Bekkedahl, N., entropy of isoprene, 260
Belajev, A. F., detonation, 3775; explosives, 4590
Belcher, D., pH scale, 2993
Belikov, M. V., two-quantum states of H_2^+, 220
Beljajev, L. I., electrophoretic phenomena on metals, 411
Bell, G. E., X-ray protection, 4713
Bell, H., PbS bands, 2044
Bell, R. P., dipole moments of HCl and DCl, 4647; reaction kinetics, 786; wave functions, 1468
Bellanca, A., time-temperature curves, 1242
Belluigi, A., electrical prospecting, 1074; seismic electric effect, 3181
Bellustin, S., current in vacuum, 383
Belot, J., h.v. therapy, 3413
Belov, A. V., ignition of hydrocarbons, 3776
Bemporad, A., Quintuple star, 3158
Bemporad, G., stellar motions, 3144
Bender, D., refractive index of air, 3702
Benedict, M., ice point and triple point of water, 2075; P.V.T. data of N_2, 257
Benedictus, W., Dirac's equations, 3529
Benford, F., anomalous numbers, 2704
Benjamin, M., oxide-coated kathodes, 2199
Benndorf, H., air currents in closed vessels, 2818
Bennett, A. L., brightness of moon, 3141
Bennett, E., conductivity cells, 5036
Bennett, W. E., actinon, 2399

Bennewitz, K., molecular heat of vapours, 2494
Bennister, H. L., activated C, 3452
Benson, A. N., nuclear moments of Ba, 224
Benton, W. W., contact angles, 494
van den Berg, G. J., electrical resistance of Au, 2136
van der Berg, A., reflectivity of corrugated surfaces, 192
Berg, W. F., crystal growth, 434; photochemical processes, 3678*; reciprocity law, 4492
van Bergen, F., resistance variation in magnetic field, 2163
Berger, P., weather forecasting, 561
Bergeron, L., impact, 4794
Bergmann, E., dipole moments, 4213
Bergmann, L., light diffraction by h.f. sound, 3334
Bergmann, P., Schiller layers, 1304
van Berkel, W. P. J., Langmuir probe characteristic, 2115
Berkley, E. E., microphotometer, 4103
Berkner, L. V., ionosphere, 2191, 3420
Bernal, J. D., viscosity of liquids, 90
Bernard, L., polarisation of light by sols, 912
Bernard, P., atmospheric Na, 3623; microseisms, 3184
Bernard, R., atmospheric Na, 2800, 3625, 4431; excitation of N_2, 292; fluorescence in upper air, 1552; night sky, 3624; twilight, 2370
Bernardini, G., disintegration of Be and B, 4449; energy of γ-rays, 612
Berndt, levers, 4784
Berndt, G., caliper gauges, 55
Bernet, E. J., disintegration of F, 4452; electrostatic generator, 2162
Bernheimer, W. E., sunspots, 3161
Bernstein, H. J., molecular vibration, 4960; Raman spectra of hydrochlorides, 1657; Raman spectra of oximes, 1658
Bernstein, S., dipping mechanism for films, 1867
Berriman, R. W., spectroscopy and valency, 2901
Berstein, I., auto-oscillating system, 4723
Berton, A., absorption spectra of MoO_3-NaOH systems, 2039; reflection spectra of solids, 3718; spectra of oxides, 4950
Bertrand, G., measurement of g, 3927
Best, J. E., ionosphere, 375, 1756
Beth, E., quantum theory of non-ideal gas, 258
Bethe, H. A., deuterons, 3834; electron scattering, 2597; energy of deuteron, 1370; excitation functions, 3634; light nuclei, 4272; nuclear reactions, 1112; order and disorder in alloys, 2236
Bethenod, J., condenser discharge, 289
Bettelheim, F., radiographic detail, 5068
Betteridge, W., Cd-In alloys, 2674
Betz, H., anode glow, 3345; electrolytic valve anodes, 851; glow discharge, 2968
Betz, P. L., Cu arc, 808
Beukers, M. C. F., fine grain developers, 2429; latent image, 3690
Beynon, W. J. G., magneto-optical dispersion of alcohols, 1590, 1591
Bhabha, H. J., cosmic rays, 643; heavy electrons, 2648
Bhagavantam, S., light-scattering in H_2O and D_2O, 1609; molecular vibrations, 4552, 4553, 4554; specific heats of liquids, 2495
Bhatnagar, S. S., magnetism of Cr compounds, 4696; magneto-chemistry, 2621; paramagnetism of Fe group, 1738
Biastoch, K., H_2-Cl_2 electrode, 842
Bickley, W. G., sphere rotating in fluid, 2268
Bidasio, D., atmospheric turbidity, 2363
Biedermann, M. M., polarisability of molecules, 3816
Bielicki, M., comet Wolf I, 96
Biermann, L., absorption in celestial spectra, 4414; stability of stars, 3591
Biermasz, T., heat conduction in crystals, 760, 2071, 3762
van Biesbroeck, G., nebular spectrograph, 2749
Bigelow, L. A., parachor of NO_3F, 84
Bigg, W. H., ice formation in clouds, 1088
Bijl, A., liquid He II, 1235; molecular interaction, 404
Bijlaard, P. P., plastic buckling, 3604, 4317
Bikerman, J. J., electroosmosis, 24; film potentials, 3124; foaminess, 2311; surface tension, 4822
Bilham, E. G., height computator, 2373
Billing, H., canal rays, 4202
Billy, M., reflection spectra of solids, 3718
Biltz, M., photographic sensitivity, 3683
Binayendra, N. S., latent heat of fusion, 3318
Binder, J. L., ICl spectrum, 3732
Binks, W., γ-ray measurement, 4256; X-ray protection, 4713
Binnie, A. M., overflow pipes, 4329
Biot, A., quartz plates, 2440
Biot, M. A., shearing stress in bending, 945
Biquard, D., Raman spectrum of indanone, 3276
Biquard, P., h.f. sound in liquids, 2533
Birch, F., finite strain, 1809; shear waves in granite, 1558; viscosity of B_2O_3 glass, 4377
Bircumshaw, L. L., Au sols, 4743; oxidation of metals, 2307
Birkhoff, G. D., electricity as fluid, 4689

Birnthaler, W., heats of dilution, 4169
Birus, K., Rayleigh scattering, 1610
Bisch, J., active Al, 4214
Bishui, I., Raman spectra of mixed crystals, 1660
Bittel, H., electric and magnetic properties of Ni, 1709, 4204
Bitter, F., ferromagnetism, 3398
Bizette, H., susceptibility of MnO, 4694 ; susceptibility of NO, 3022
Bjerge, T., neutrons from Be, 601
Bjerknes, J., adiabatic ascent of air, 2361
Björnståhl, Y., Kerr constants, 4072
Black, A. N., relaxation methods, 946
Black, L. F., focalograph, 3032
Black, R., diffraction of sound, 3325
Blackett, P. M. S., cosmic rays, 1598, 1988
Blackman, M., anomalous vibrational spectra, 719 ; susceptibility of Bi, 2624
Blair, J. M., latent image, 176
Blake, F. C., order-disorder in crystals, 4299
Blanc, M., X-ray reflection in crystals, 746
Blanc-Lapierre, A., birefringence of quartz, 195, 4930
Blanchet, G. H., interstellar absorption line, 2333 ; orbits of H.R. 5472, 2763
Blank, O., Sm spectrum, 4948
Blaton, J., multipole radiation, 1134
Blau, M., cosmic rays, 2848, 2849 ; range of H-rays, 618
Bleakney, W., mass spectrometer, 1769
Blechschmidt, E., Mn ferrites, 2574
Blicher, A., dielectric constant of water, 1293
Bloch, F., neutron absorption in Co, 337
Blochinzew, D., phosphorescence, 1602
Block, W. I., ionisation of air by X-rays, 4574
Blokhin, M., analysis of Zr, 2493
Blondel, A., luminous field, 181, 4920 ; photometer, 2872
Bloomenthal, S., CuCl band system, 4542
Blüh, G., thermal diffusion, 43
Blüh, O., adsorption in electric field, 77 ; thermal diffusion, 43
Blum, E., condenser discharges in H_2, 2545
Blum, H. F., visual purple, 2056
Blumbach, F. I., Comet Finsler (1937 f), 3130
Bluschke, H., infra-red reflection of glasses, 2032
Bock, H., heat engine, 2077 ; synchronous clocks, 3562
de Bock, J., cosmic rays, 1144
Bodenstein, M., $COCl_2$ formation, 2868
Böhm, H., chrome alum spectrum, 3717
Böhm, K., X-ray distribution, 4968
Boelter, L. M. K., evaporation of water, 4600
de Boer, H. J., energy exchange at surfaces, 3760 ; 5·25 year weather cycle, 3172
de Boer, J., Curie point of Ni-Cu alloy, 356 ; liquid He II, 1235 ; molecular interaction, 404
de Boer, J. H., secondary electron emission, 860 ; surface structure, 80 ; van der Waals forces, 405
Börger, E., heat of solution of $AlCl_3$, 3772
Boersch, H., electron diffraction bands, 1309 ; electron optics, 344
Böttcher, C. J. F., dipole liquids, 3367
Boggio, T., charged particle in magnetic field, 4679
Bohr, N., α-particle emission, 4060 ; atomic nucleus, 2712 ; nuclear photo-effects, 1368 ; report of Committee on Atoms, 394
Boissonnas, C. G., nitrocellulose-cyclohexanone system, 2691
Boizowa, S., spectrum of Te in H_2SO_4, 690
Bok, B. J., galactic structure, 1048 ; radial velocities, 1034 ; stellar distribution, 1026 ; stellar magnitudes, 1032
Bolla, G., line spectrograms, 230 ; spectrophotometry, 734
Bollot, J., hyperfine structure, 721
Boltz, H. A., insulation measurements, 3362
Bond, W. L., etch figures of quartz, 3918
Boner, C. P., organ pipes, 3329
Bonhoeffer, K. F., reaction kinetics, 786
Bonhoure, A., boiling point of water, 787
Bonner, L. G., vibration spectra and molecular structure, 4128
Bonner, T. W., disintegration of D, 2392; disintegration of N, 141
Bontenbal, J., contrast of photographic papers, 1613
Booker, H. G., ionosphere, 2191, 4725
Boolinsky, V., motion of ideal gas, 3931
Boomer, E. H., gas-liquid hydrocarbon systems, 5004
Booth, E. T., thermoelectric power of Rh, 3881
Bopp, F., supraconductivity, 1282
Borchert, L. H., Kerr effect in CO_2, 1589
Borden, A., spectrum of CH_3OH, 4525
Borgnis, F., conduction by convection and diffusion, 2558; currents in dielectrics, 3364; theory of probes, 2114
Born, M., atomic nuclei, 2649; condensing systems, 2719; field theory, 1852; relativity and quantum theory, 1477
Borocco, A., dissociation pressures of NaD, NaH, KD and KH, 793; dissociation pressures of RbH, CsH, RbD and CsD, 2523; mercury fulminate, 3677
Boros, J., ionic conduction in NaCl, 1286
Borowicz, J., colloidal Ag, 2231
v. Borries, B., electron microscope, 2606, 2607, 4231

Borst, L. B., infra-red spectrum of water, 1194
Borziak, P. G., negative photoconductivity in Cu_2O, 897
van den Bos, W. H., double stars, 1916; stellar orbits, 1529
Bosch, W. C., dual-range potential source, 4635; supersonic oscillator, 4612
Bose, J. K., SiC rectifier, 3806
Bose, S. N., radio waves in ionosphere, 3873
Bose, U. K., kathodic sputtering, 3343
Bosler, J., earth currents, 2817
Bosschieter, G., spectra of CH_3OD and CH_2DOD, 4526; water molecules in solutions, 1193
Bosshard, W., piezoelectric vibrations, 1358
Bosworth, R. C. L., evaporation of Na films, 2521; intermolecular forces, 487, 1484
Bothe, W., cosmic rays, 593, 2423; transmutation of B^{10} into C^{13}, 143
Bottema, J. A., allotropy of Nd, 1380
Botti, E., rare-earth compounds with Bi, 932; structure of alloys, 1787
Bouchard, J., thermoelectric power of Fe-Ni alloys, 899, 2201
Bouhet, C., Raman lines of quartz, 228
Boulton, J., photosensitisation, 3684*
Bouman, J., reciprocal lattice, 1412, 1413, 1800
Bound, R. A. M., high-vacuum camera, 179
Bourgeois, R., radio-sonde, 4869
Boutaric, A., adsorption of mixtures, 990; ampholytes, 3104; conservation of electricity, 2618; expansion of gels, 1774; polarisation of light light by sols, 912; viscosity of As_2S_3 solutions, 13
Boutillier, A., expansion of Cu-Al alloys, 4983
Boutry, G. A., photo-cell, 3423
Bouwers, A., neutron generators, 4718
Bouwkamp, C. J., paramagnetic crystals, 3396
Bowen, I. S., cosmic rays, 1141, 2854; Cr, Mn and Fe spectra, 204; low terms in CoVI, 2888; stellar spectrograph, 3986
Bower, J. C., disintegration of B, 2390; ionisation range of particles, 3644
Bowls, W. E., ionisation coefficients, 1705
Boyce, J. C., eclipse equipment, 1006
Boyd, C. D., variable stars, 1057
Boyd, W. E., radiographic models, 3862
Boyden, C. J., depressions, 1087
Bozorth, R. M., focusing of X-ray beam, 2058
Bracewell, K. H., positive ions, 5027
Bradbrook, E. F., phthalocyanine spectra, 4133
Bradbury, N. E., atmospheric nuclei, 4430; ionosphere, 371, 2193; neutron absorption in Co, 337
Bradford, S. C., kinetic theory of fluids, 54
Bradley, A. J., Cu-Ni-Al alloys, 3910; Fe-Ni-Al alloys, 2671; structure of Co_2Al_5, 3912
Bradshaw, B. C., photolysis of H_2S, 3676
Braestrup, C. B., Geiger-Müller counter, 892; X-ray protection, 4253
Brager, A., structure of BN, 424
Bragg, W. H., clay, 3169; ice, 3915; structure of solids, 929
Bramley, A., K-A transformation, 137; radioactivity of K, 1947; X-particle, 1975
Brand, J. O., colorimetry of dark surfaces, 4467
Brandenberger, E., forbidden X-ray reflections, 236
Brandt, H., radio-Al and radio-Cl, 2388
Brandt, O., dust, 4748
Brattain, K. G., synthesis of HI by α-rays, 3200, 4891
Brauer, P., X-ray spectral analysis, 4156
Braunbek, W., elasticity of rubber, 3501; Rutherford scattering, 4674
Bray, C. W., electrical responses of the ear, 802
Brazier, C. E., climate of Paris, 559
Brdička, R., absorption spectra of $CoCl_2$ solutions, 3262
Breckpot, R., polarity in electric arc, 1178; spectral analysis of Nb and Ta, 1176; spectral analysis of Pb alloys, 1177
Breese, D. I., electrophoresis, 3453
Breit, G., Coulomb wave functions, 4802; ground level of ^7Li, 2028; K-electron capture in Be^7, 4890; nuclear forces, 3043; nuclear interactions, 1569
Bremmer, H., radio wave propagation, 3035
Bremner, R. W., conductance of KCl solution, 309
Brenet, J., emission of α-particles, 1959
Brenschede, W., $COCl_2$ formation, 2868
Brentano, J. C. M., X-ray powder reflections, 1414
Bresler, S. E., surface layers, 1491
Bresquer, R., explosive limits, 771
Bretscher, E., disintegration of B, 2390; nuclear isomerism, 1949; proton tracks, 335
Brewer, A. K., atomic weight of Rb, 1762; glow discharge, 290; radioactivity of K, 1947
Brewer, F. M., structure of germanous iodide, 1400
Breyer, F., gravimetry, 3928
Bricard, J., fog coronæ, 2364, 4862
Brickwedde, F. G., colorimetric purity, 2411; neutron scattering, 4226; supraconductors, 1284
Brickwedde, L. H., Weston standard cells, 2589
Bridgeman, O. C., gasoline-alcohol mixtures, 484

Bridgman, P. W., compressibilities, 1798; electrical resistance under pressure, 2135; phase diagram of water, 781; polymorphic transitions, 1799; rupture, 3926
Bridgwood, T. G., iron-cored circuits, 3015
van den Briel, J. K., solar spectrum, 2350
Brigatti, C., glare, 3282
Brigatti, C. V., parallel plates, 3498
Briggs, H. B., optical constants of Rb and Cs, 191; emission of alkali-metal films, 5078
Brill, A., stellar statistics, 520, 1901
Brill, R., surface films, 3555, 4364*
Brindley, G. W., atomic vibrations in Mg, 3907; lattice-distortion in Rh, 2673; X-ray scattering, 238, 239
Brinkley, S. R., Jr., liquid junction potentials, 4664
Brinkman, H., Cd spectrum, 1640; electron diffraction patterns, 3837
Britton, H. T. S., buffer solutions, 846; calomel electrodes, 845
Brixel, E., retention of vapours by gels, 3968
Brockway, L. O., internuclear distance in F_2, 3047; structure of hexacarbonyls, 4740; structures of B compounds, 7; structures of chlorobenzenes, 8; structures of P and Si compounds, 3889; structures of PMe_3 and $AsMe_3$, 2653
Broda, E., adsorption of chain molecules, 3116
Brode, R. B., cosmic rays, 594, 2853
Brode, W. R., eclipse equipment, 1006
Brodovitskij, K., latent regularities, 1456
Brodsky, A. E., isotopic constitution of water, 395; Raman spectra of PCl_3 and $BiCl_3$, 1220; spectra of D_2O solutions, 2464
Broersma, G., turbulent motion, 459
Broniewski, W., Al-Cu alloys, 4581; susceptibility of alloys, 4246
Brons, F., paramagnetism, 884, 4244
Bronson, H. L., heat capacity of Bi, 4978
Brookman, E. F., structure of polymers, 6
Brooks, H. B., inductor, 357
Broughton, G., dilute suspensions, 2218; viscosity of emulsions, 1387
Broughton, J. W., heat capacity of C_2H_4, 4162
Browko, I. E., crystallisation of undercooled liquids, 1797
Brown, A. C., vapour pressures of alcohol-heptane mixtures, 2953
Brown, B. W., cosmic rays, 642
Brown, E. W., lunar perigee, 1019
Brown, F. G., non-galactic nebulæ, 1509
Brown, G. B., organ pipes, 1256
Brown, R. C., surface tension, 993
Brown, W. F., Jr., ferromagnetics under stress, 2166, 3844
Broxon, J. W., γ-ray ionisation, 3202, 3203, 4895
Brož, J., Laue diffraction photograms, 4571
Brubaker, G., neutron emission, 1572
Bruce, W. A., X-ray scattering by quartz, 4263; X-ray scattering by Zn, 2916
Brüche, E., electron optics, 2608
Brück, H., stellar classification, 4848
ten Bruggencate, P., solar granulation, 543, 3599
Bruhat, G., birefringence of quartz, 195, 4930
Bruining, H., secondary electron emission, 860
Bruins, E. M., cosmic rays, 1145, 2419
Brukhatov, N. L., magnetic energy in Ni crystals, 1325
Brun, E., pressures on rotating body, 3536
Brun, J., densities of D_2O and H_2O, 3489
Brunauer, S., multimolecular layers, 1479; surface of adsorbents, 488
v. Brunn, A., deflection of light, 69
Brunner, E., continuous X-ray spectrum, 2061
Brunt, D., water vapour in upper air, 3619
Brutzcus, M., calorific powers of hydrocarbons, 2941, structure of hydrocarbons, 2210; thermochemistry of of S compounds, 2080
de Bruyn, H., electrodialysis, 3900
Bryant, W. M. D., optical constants of crystals, 3063
Brylinski, E., magnetic field, 4688
Buarand, J., waves on water, 1821
v. Bubnoff, S., structure of earth, 4025
Buchmann, K., efficiency of tube counters, 149
Buchwald, C. E., monofilms of barium stearate, 2742
Buchwald, E., classical optics, 1170
Buck, J. H., induced radioactivity, 1951
Buckingham, R. A., equation of state of He, Ne and A, 4593; neutron-proton interaction, 336; properties of He, 4997
Buckley, H., candle-power standards, 184
Budó, A., anomalous dispersion, 5037 perturbations in band spectra, 3267
Buerger, M. J., X-ray reflection, 3054
Bugakov, V., diffusion of metals, 440, 441
Bugyi, B., fluorescence of dyestuffs, 4088
Buhl, O., hyperfine structure of Hg, 3247, 4519
Bull, L., electric sparks, 288
Bullard, E. C., geophones, 2784; seismograph, 2808; temperature in earth's crust, 2353
Bullen, K. E., seismic waves, 2807
Burawoy, A., spectra of azo-compounds, 713
Burch, C. R., autocollimation, 3572

Burcham, W. E., transmutation of F, 4455
Burdon, R. S., spreading of drops, 492, 493
Bureau, R., short-wave fading, 1346; thunderstorms, 2812
Burg, A. B., Raman spectrum of B_2H_6, 4558
Burger, H. C., hyperfine structure of Hg, 1643, 2459
Burgers, W. G., metal surfaces, 1864
Burgess, R. E., valve voltmeter, 2559
Burhop, E. H. S., annihilation of positrons, 3389; production of γ-rays by neutrons, 1583
Burkhardt, G., electron pair production in Pb, 333
Burnop, V. C. E., boiling points, 3323, 5001
Burton, A. C., thermostromuhr, 1746
Burton, E. F., low-temperature research, 4168
Burton, M., photochemistry, 3679, 4918, 4919
Burwell, A. W., oiliness, 1870
Burwell, C. G., Ba II in stellar spectra, 4391
Busch, G., piezoelectric vibrations, 1358; "Rochelle-electrics," 3369
Bush, G. B., tomography, 4705
Buss, W., h.f. sound absorption, 5011
Buswell, A. M., absorption bands of hydrogels, 706; association and complex formation, 4956, 4957; association in carboxylic acids, 4530; infrared spectrum of water, 1194
Butajewa, F., low pressure Hg discharge, 2122
Butkow, K., spectrum of Te in H_2SO_4, 690; units, 465
Butler, J. A. V., adsorption on Pt electrodes, 4220; passivation of Au, 3381
Buyn, K. E. C., polystyrene films, 4747
Byers, H. R. isentropic charts, 3170
Byler, W. H., phosphors, 1992, 2863

Cabannes, J., atmospheric Na, 2799, 3177, 4043; night sky, 1094; Raman effect in gases, 1661; Raman lines of quartz, 228
Cabrera, B., susceptibilities of rare earths, 3851
Cacciapuoti, N. B., decay constant of P^{32}, 4448
Cady, H. P., molar weights of vapours, 1802
Cady, W. G., piezoelectricity, 5080
Caglioti, V., structure of KHF_2, 3913
Caillol, P., angle measurement, 4336
le Caine, H., X-ray current regulator, 3286
Calder, W. A., brightness of sun, moon, Capella, Vega and Deneb, 1071; 44i Bootis B, 1919; Pleiades, 1033
Callendar, G. S., effect of CO_2 on air temperature, 2356
Calmon, C., thermodynamics of HCl in dioxane-water mixtures, 1689, 4597
Caloi, P., earth's crust, 2805
Camelford, J. A., oiliness, 1870
Cameron, A. E., Pt electrodes, 2585
Cameron, D. M., CO_2 spectrum, 1195
Cameron, W. H. B., Cl_2^+ spectrum, 1208
Camichel, H., aurora, 1555
Cammerer, I. S., heat conduction of insulators, 759
Campbell, A., self inductance, 3796
Campbell, E. C., isomerism in radiosilver, 1571
Campbell, J. S., InII spectrum, 1189
Campbell, L., long-period variables, 1058; observations of variable stars, 1527, 3157, 4009
Campbell, N. R., rectifier photo-cells, 5079
Campbell, W. B., adsorption of alkalis, 3550; dielectric constant of cellulose, 4655; heats of wetting of cellulose, 489
Campolieti, F. F., cosmological problem, 1503
Canals, E., Raman spectra of hydrates, 4144; Raman spectra of powders, 2476
Cance, J. P., velocity of sound, 1697, 4183
Cannon, A. J., stellar spectra, 1038
Capatos, L., Ag-Cd and Cu-Cd systems, 2164; atomic moment of Re^{IV}, 3402
Carder, D. S., vibrations of bridges, 1559
Carnera, L., latitude, 4384
Čarnyi, I. A., flow in pipes, 1428
Carpenter, D. C., optical rotation of gelatin, 186
Carpenter, E. F., associated galaxies, 4386
Carr, E. P., butene-2 and pentene-2 spectra, 213; u.v. absorption in hydrocarbons, 1210
Carrelli, A., frequency of diatomic molecules, 219; H_2O spectrum, 206; vibration of C-H linkage, 2891
Carrière, Z., modulation by flames, 275; singing flames, 4604
Carroll, K. G., binding energy of Li^6, 4736; van der Waals forces, 1466
Carruthers, J. C., electrophoresis, 921; stability of dispersions, 2230
Carslaw, H. S., heat conduction, 4577
Carson, W. L., photoelectric galvanometer, 3878
Cartan, L., focusing of charged particles, 867
Carty, J. R., soft tissue radiography, 2184
Carwile, P. B., Ampère's law, 877; Rayleigh-Jeans formula, 2845
Casado, F. L., pyknometric method, 439
Casimir, H. B. G., electrical resistance of Au, 2136; heat conduction in crystals, 3301; paramagnetic relaxation, 3855

Cassel, H. M., emulsification, 2299
Cassen, B., h.v. X-ray distribution, 2630; X-ray filters, 4711, 4712
Castagnetto, L., vortices, 2265
Cattaneo, C., mechanics of elastic bodies, 3523, 4339
Cauchois, Y., element 93, 4115; L-spectra of Th, 1229; white and black lines in X-ray spectra, 1227
Cavassilas, D., atmospheric O_3, 117; light filters, 4564
Čelinzev, V., Raman spectra of organic acids, 4148
Cennamo, F., Raman spectra of alcohol mixtures, 2907
Centnerszwer, M., colloidal Ag, 2231
Černiaev, V., H and D Balmer series, 3707
Cernuschi, F., adsorption isotherm, 1854; adsorption theory, 3545
Cettei, M. S., reflection factors, 4108
Chadenson, L., wave mechanics, 3534
Chadenson, P., celestial mechanics, 3583
Chadwell, H. M., freezing points of solutions, 3305
Chadwick, J., cyclotron, 4900; proton tracks, 335
Chadwick, T. C., manometer, 3537
Chakrabertty, S. K., viscosity of mixtures, 3126
Chakravarty, M. K., attenuation of radio waves, 4724; electrical constants of soil, 2355
Chakravorti, S. K., spectrum of diatomic molecule, 2902
Chalklin, F. C., vacuum spectrograph, 4975
Chalmers, B., resistance of Sn, 2979
Chalmers, J. A., charges on raindrops, 133; reflection of β-rays, 1127
Chamberlain, K., KBr crystals, 4766
Chambers, H. H., chemisorption, 2732
Champion, F. C., continuous β-ray spectra, 1128; scattering of β-particles, 4673
Chandra, K., convection in air, 1237
Chandrasekhar, S., star-streaming, 4841; stellar absorption lines, 2339; stellar equilibrium, 105, 2771; stellar radial velocities, 3588
Chang, T. L., diffusion of gaseous mixtures, 3494
Chang, T. S., superlattices in alloys, 2237
Chang, W. Y., α-particles from ^{8}Li, 2827
Chao, J., sorption by cellulose, 3542
Chapman, D. L., lubrication of taps, 500
Chapman, S., aurora, 2371; electrification by bubbling, 4827; heating of earth by electric currents, 587; heating of ionosphere, 586; lunar atmospheric tides, 3614; magnetic storms and aurorae, 2814
Charlton, A. L., X-ray intensity, 3756
Charriou, A., photographic development, 4100
Charron, F., frictional heat distribution, 3296
Chase, A. M., visual purple, 3754
Chaumeton, L., dehydration of $Cu(OH)_2$, 2622
Cheesman, D. F., dual emulsions, 2229
Ch'en Shang-Yi, Rb and Ce bands, 3256; Rb principal series, 202
Cheng, C. S., structure of Co_2Al_5, 3912
Cheng, H. C., Raman spectra of benzene derivatives, 729
Cherdynzev, V., α-decay, 2830
Chernjajev, V., large-aperture spectrographs, 731
Cherry, B., radial velocities, 1034
Chevallier, R., magnetic properties of $Fe(OH)_3$, 3399, 3846
Chevenard, P., diffusion in metals, 3492
Childs, C. B., ionosphere, 4260
Chittum, J. P., conductance of salts in H_2O+D_2O, 310
Chivers, E. W., photometry of projectors, 2436*
Choong Shin-Piaw, spectra of Se, Te and their oxides, 4541
Choucroun, N., electric moments, 2741
Chramov, V. A., energy loss of electrons, 3835
Chrapływy, Z., Born's electrodynamics, 3026
Chrétien, A., active Al, 4214
Christie, W. H., radial velocities of stars, 3148
Christopherson, D. G., fluid motion along tube, 4783; relaxation methods, 4776
Chu, T. C., u.v. bands of C_2H_2, 2452
Chung Ming-San, vibration of quartz cylinder, 2096
Cibié, P., photometry of projectors, 4922
Cichocki, J., crystal lattices, 2668; radio-Si, 4058
Cirg, I., *see* Zirg, I.
Cisotti, U., hydrodynamic sources, 3078
van Cittert, P. H., hyperfine structure of Hg, 1643, 2459
Clapp, R. C., Grotthus and Einstein, 660
Clark, A. B., visual adaptation, 741
Clark, A. L., Joule and Joule-Thomson effects, 2084
Clark, C., surface tension, 3977
Clark, C. H. D., band-spectral constants, 4962; spectroscopy and valency, 2901
Clark, C. W., resistance-thermometer heaters, 2937
Clark, G. L., analyses of steel rings, 355; magnetic field of parallel wires, 354; structure of cellulose, 3451; structure of living materials, 1781; problem of *n* bodies, 2724; structure of $Zn(SbO_3)_2$, 31; X-rays from radio valves, 745
Clark, J. W., uniform magnetic field, 5062
Clark, O., neutron scattering, 866
Clark, R. J., velocity of light, 4153
Clavier, J., stellar proper motions, 3143

Clay, J., conductivity in gases, 1266; cosmic rays, 1142, 1143, 1144, 1145, 1575, 2419, 4475, 4476, 4913; γ-ray ionisation, 3651, 3652; Rn in air, 1565
Clay, P. H., cosmic rays, 4475, 4913
van Cleave, A. B., adsorption on W, 3972
Clem, W. J., transition of Na_2SO_4, $7H_2O$, 2505
Clemo, G. R., spectra of pyridine derivatives, 4536
Cleveland, R. S., thermal transmission of textiles, 232
Clews, C. J. B., structure of rubber, 1390
Cline, J. E., photolysis of H_2S, 3676
Clow, A., resonance in urea and derivatives, 1737
Clusius, K., thermal properties of D_2, 774; transformation of H_2S and D_2S, 4173; transitions of solid CH_3D and CD_4, 782
Coblentz, W. W., eye-protective glasses, 3745; u.v. solar intensities, 1079
Cochran, W. G., weather, 4861
Cochrane, W., polish on metals, 2308
Cockburn, R., voltage-distribution diode, 1345
Cockcroft, J. D., low-temperature research, 2934
Cohan, L. H., sorption hysteresis, 1480
Cohen, E., structure of ice, 3469
Cohen, K., solvent action on rotatory power, 1626
Coheur, P., anodic behaviour of Pb, 1301
Cohn, B. E., colour excited by Ra in glasses, 1993
Cohn, W. M., coronal polarisation, 2348; glucose glass, 1224; polarigraph, 2878; sky light, 2368
Colacevich, A., Comet Finsler (1937–8), 1009
Cole, R. H., dielectric absorption, 3370; magnetic field meter, 3406
Coliez, R., h.v. therapy, 3413
Collens, H., lightning, 2383
Collie, C. H., atomic physics, 901; stellar radiation, 3592
Collier, L. J., atmospheric telephotometer, 570
Collins, G. B., Čerenkov radiation, 4471
Collins, J. R., polarising nicol, 2012
Collins, O. C., reflection nebulæ, 516
Colombino, P., secondary electron emission, 2153
Colwell, R. C., velocity of sound, 2956; vibration of plates, 444, 3328
Comparat, P., excitation of N, 3632, 4055
Compton, J., cellulose solutions, 3896
Condon, E. U., optical rotation, 185; philosophical concepts, 1845
Conrad, A. G., electrical studies of living tissue, 1745
Conrad, V., earthquakes, 1939
Constantinesco, L., explosion potential, 3798
Cook, A. H., phthalocyanine spectra, 4133
Cook, J. H., M.K.S. units in electro-acoustics, 2539
Cooke, R. G., spectra of carbonyl compounds, 4535
Cooke, T. F., Jr., KCl-LiCl and HCl-HBr mixtures, 264, 265
Coolidge, A. S., H_2 spectrum, 2337; molecular potential curves, 4961; wave functions for excited H_2, 4939
Coolidge, W. D., short-wave X-rays, 3031
Coomber, D. I., dipole moments, 4653
Coop, I. E., dipole moments of HCl and DCl, 4647; electric polarisation, 4652
Coop, J. J., tones produced by wire in flame, 2529
Copeland, C. S., neutrons from light elements, 3196
Copley, M. J., halogen films on W, 386; solubility of haloforms, 3106
Coppoc, W. J., coagulation, 1778
Corben, H. C., straggling of electrons, 5053
Cordingly, N. C., breakdown in X-ray tubes, 4716
Corey, R. B., structure of diketopiperazine, 3480
Corin, C., CH_2Cl_2 spectrum, 1648
Cork, J. M., Sc isotopes, 2826
Corlin, A., meteorites, 2318
Cornec, E., freezing points of solutions, 4985
Cornell, S. D., HgCl, CdCl and ZnCl spectra, 4138; SrCl and SrH spectra, 2894
Cornford, C. E., katabatic winds, 4428
Cornish, V., apparent enlargement of sun, 544
Corrigan, K. E., h.v. X-ray distribution, 2630; structure of human bone, 1408; X-ray filters, 4711, 4712
Corson, D. R., cosmic rays, 2853
Coryell, C. D., dipyridine chlorides of Mn and Co, 3887; ferrohæmoglobin, 3401
Cosman, B. J., X-ray protection, 3410
Costeanu, G., Raman spectra of NH_3 and NH_4 ion, 4145; vapour jet, 1444
Costeanu, V., rhythmic precipitation, 3903
Coster, D., u.v. absorption of Au and Ag, 3207
Cotte, M., electron optics, 1315
Cotton, A., birefringence, 4505; intense magnetic fields, 3014; magnetic field, 4688
Couffignal, L., calculating machines, 1498
Coulomb, J., caustic curves, 3218; earth's magnetism, 3186; seismographs, 1941
Coulson, C. A., electronic structure of molecules, 905; self-consistent field for H_2, 2286; wave functions, 1469

Coulson, N., TlCl spectrum, 2893
Coulter, L. V., thermal data of Na_2SO_4, 3320
Courtot, G., birefringence, 4505
Cousins, G. E., magnetometer, 5064
Cowie, A., ionosphere, 4260
Cowley, E. G., dipole moments, 3820, 5039
Cowling, T. G., binary stars, 4835; stellar equilibrium, 3152
Craggs, H. C., photochemical union of H_2 and Cl_2, 1156
Craig, D. N., electrolytic resistors, 3769
Craik, K. J. W., brightness discrimination, 3748
Cramer, H., twinning in metals, 4297
Crane, H. R., cloud chamber, 152; electron absorption, 2156; neutrino, 2843
Cranna, R., balloon theodolite, 4870
Crawford, B. L., Jr., infra-red and Raman spectra, 4944; $Ni(CO)_4$ spectrum, 4127
Crawford, M. F., normal state of He, 4123
Crawshaw, J. D., cosmic rays, 4084
Craxford, S. R., electrocapillarity, 2745; surface pH, 2744
Creffier, J., spectral analysis of Nb and Ta, 1176; spectral analysis of Pb alloys, 1177
Cremer, E., diffusion in solid H_2, 2690
Crenshaw, J. L., dissociation pressures of NaD and NaH, 792
Crestani, G., snow gauge, 2374
Cricks, R. H., kinematography, 2004
Critchfield, C., nuclear forces, 2645
Critchfield, C. L., deuterons, 3834
Crommelin, A. C. D., comets, 1884; minor planets, 1894
Crommelin, C. A., constants of Kr, 438
Cross, P. C., Ni $(CO)_4$ spectrum, 4127
Crossley, A. F., air pressure, 3611
Crowfoot, D., structure of insulin, 938
Crowther, J. A., biological action of X-rays, 1751; colloidal graphite, 3292
Crozier, W. J., discrimination of intensities, 2485; visual flicker, 739, 740, 2484, 3283, 3284
Crudup, J., cosmic rays, 4481
Crussard, J., nuclear reaction Be (α, n), 597
Cuffey, J., galactic clusters, 1042
Culbertson, J. L., Hg-oil systems, 2303
Cundy, H. M., energy-level of diatomic molecule, 976
Cunningham, L. E., orbit of Apollo, 1029
Curie, I., radioelement formed from U, 2386, 3193
Curran, S. C., β-ray diffraction, 339; detection of β-particles, 1581
Curtis, B. R., positrons, 3383
Curtis, C. W., Mn II spectrum, 2019
Curtis, H. L., absolute ohm, 5031
Curtiss, L. F., cosmic rays, 640, 642
Custers, J. F. H., surface structure, 80
Czerny, M., infra-red technique, 687, 1163, 4561

Dahl, A. I., thermocouples, 2643
Dahl, H., air sound senders, 3341; ocean current recorder, 4019
Dahl, O., ocean current recorder, 4019
Dainton, F. S., photochemistry of alkyl nitrites, 171
Dalman, L. H., solubility of citric and tartaric acids, 483
Dalmon, R., HNO_3 spectrum, 4538
Daly, R. A., earth's outer shells, 2789
Damköhler, G., dielectric constant of HBr, 1294
Dane, E. B., Jr., micro-camera, 178; viscosity of B_2O_3 glass, 4377
Danforth, W. E., r.f. voltage of cyclotron, 3352
Daniel, V., diffusion of electrolytes, 3920
Daniels, F., photochemistry, 4485
Daniels, H. E., significance tests, 3519
Danilow, V., crystallisation nuclei, 33
Danilow, V. J., structure of liquid metals, 1793, 1794
Danjon, A., stellar orbits, 1530
Dannöhl, W., permanent-magnet alloys, 4236
Danz, W., solubility of D_2 and H_2 in Pd, 71; susceptibility of D_2-charged Pd, 307
Darbyshire, J. A., oxide-kathodes, 3840
Dartnall, H. J. A., visual purple, 744
Darwin, C. G., logic and probability, 3963; low temperatures, 4166
Das, S. R., allotropes of S, 3893
Dasannacharya, B., Foucault pendulum, 2282
Dass, I. N. D., colour and constitution, 4464
Datt, B., gravitational equations of relativity, 1850
Datzeff, A., electrons in complex atom, 2717
Daunt, J. G., cryostat, 2938; supraconductivity, 4205
Dauvillier, A., continents and oceans, 4423; cosmic rays, 1593
Davar, D. J., dielectric properties of organic substances, 4648
Davenport, C. C., spiral springs, 1417
David, W. T., combustion levels, 255
Davidson, C. R., micrometer, 1499
Davidson, W. L., Jr., transmutation of Ti, 4453
Davies, C. W., activity measurements, 3380; conductivity of mixtures, 2567
Davies, E. R., colour charts in photography, 1585
Davies, R. M., vibrations of bars, 1425
Davies, W. T., disintegration of B, 3197
Davis, D. N., spectrum of Antares, 2335
Davis, H., brain potentials, 359, 2181
Davis, P. A., brain potentials, 359, 2181
Davis, R., photographic film shrinking, 180

Davis, R. M., dipole moments of unsaturated compounds, 1719
Davis, T. E., diffraction of sound, 3325
Davison, C., earthquake sounds, 4439
Davydov, B., motion of electrons, 287 ; semiconductors, 2560, 2641
Dawihl, W., strength of glass, 4779
Dawson, L. R., spectra of $CoCl_2$ solutions, 1651
Dawton, R. H. V. M., elasticity of Na 2694 ; X-ray crystal reflections, 4312
Day, A. L., volcanoes, 4440
Deaglio, R., glare, 3282
Deborin, G., adsorption of H_2 on Pt, 3113
Debye, P., cooling by demagnetisation, 2935 ; h.f. absorption of polar substances, 5041 ; paramagnetic relaxation, 4249
Dechêne, G., contact capacity, 2137, 3357 ; phosphorescence of ZnS, 651
Deck, W., spectrophotometer, 1665
Dedebant, G., equations of hydrodynamics, 2264 ; turbulence, 3510
Dee, P. I., proton tracks, 334
Degast, G., earth's magnetism, 3186
Dehlinger, U., ferromagnetism of alloys, 421
Deitz, V., conductance of lead abietate, 5035
Déjardin, G., atmospheric Na, 2801, 3625 ; atmospheric O_3, 117, 556, 557 ; light filters, 4564 ; night sky, 3624
Delaplace, R., pressure of gases on silica gel, 270 ; thermal conductivity of hydrocarbons, 3297
Delfosse, J. M., Raman spectra of deutero-ethylenes, 2911
Dellinger, J. H., ionosphere, 371
Delwaulle, M. L., Raman effect of ZnI_2 and CdI_2 Solutions, 1221 ; Raman spectrum of HgClBr, 3737
Deming, L. S., infra-red absorption of organic molecules, 4952 ; radio fade-outs, 4726
Demmelmair, A., cosmic rays, 1986, 2850, 4080
Dempster, A. J., atomic masses, 407 ; heavy nuclei, 2646 ; isotopes, 2207
Denekamp, P. J., dielectric constants of colloids, 317
Denison, F. N., latitude variation, 1020
Densham, A. B., conductivities of complex salts, 311
Dent, C. E., vapour densities, 2686
Depp, W. A., glow discharge tubes, 3344
Derenzini, T., reflection of X-rays, 3287
Deriagin, B., eye illumination, 1226
Déribéré, M., fluorescent minerals, 4087
Derjaguin, B., viscosity of associated liquids, 93
Dervichian, D. G., monomolecular films, 85, 996 ; surface tension, 3977
Desai, B. N., thunder, 3629
Desai, D. D., Swan bands, 715
Desai, M. C., viscosity of starch paste, 4832
Deschamps, P., electrodeposition of Cu, 2580
Désirant, M., predissociation of S, 4955
Deslandres, H., band lines, 2900, 3729 ; constant of band spectra, 1211, 2469
Destouches, J. L., heavy electrons, 2590, 2593 ; indeterminacy, 973 ; physical theory, 67
Determann, H., X-ray distribution, 235
Deubner, A., Brownian motion, 1828 ; magnetometer, 5063
DeVault, D., Raman spectrum of BF_3, 3738
Devaux, H., flower scent photography, 3691 ; monomolecular films, 995, 3554
Devik, O., air sound senders, 3341
Devonshire, A. F., critical phenomena in gases, 1683
Dewey, P. H., heats of combustion, 4987
DeWitt, B. J., Cd-Sb system, 3319
Dey, L. J. L., Rn in air, 1565
Dhar, S. C., M-functions, 1451
Dharmatti, S. S., magnetic properties of Te, 2169
Diamond, H., radio meteorograph, 1936
Diatchenko, M. N., phosphorescence of rock-salt, 1990
Dickinson, R. G., photochemistry, 4485
Diebner, K., artificial radioactivity, 3192
Dieke, G. H., H_2 arc spectrum, 699 ; H_2 bands, 4540 ; N_2 bands, 4953
Diekmann, H., complex ions, 3361
Diem, M., soil respiration, 552
Dieminger, W., ionosphere, 4728
Diesselhorst, H., trembling movements, 2708
Dietmeier, R. E., reflection and absorption in $KCl\text{-}CuCl_2$, 2442
Dietrich, A., Ba alloys with Bi, Mg and Pb, 4639
van Dijk, H., low-temperature thermometers, 3308
Dimitroff, G. Z., microdensitometer, 1007
van Dingenen, W., adsorption of He, 3111 ; adsorption of O_2 and CO_2, 486
Dingle, H., science and the unobservable, 473
Dippy, J. F. J., conductivities of organic acids, 3812
Dirac, P. A. M., new basis for cosmology, 1889 ; radiating electrons, 3660
Dirbach, W., positive column, 4195
Ditchburn, R. W., continuous spectra, 694 ; irregular gratings, 4916 ; space-time, 1834 ; sputtering of Mg in O_2, 5028
Dittrich, A., Venus, 1511
Dive, P., angular velocity of star, 2341 ; rotation in fluid star, 1047
Dixit, K. R., chemical effects of discharge, 297 ; low temperatures, 3771 magnetisation of Fe films, 4238

Dixon, E. H., thermoelectric power of Rh, 3881
Djanab, K., disintegration of N, 141
Djoudat, H., colour temperatures, 3306
Djourno, A., nerve potentials, 5066
Doan, R. L., cosmic rays, 2421
Dobbie, J. C., Fe II spectrum, 2884 ; solar eruptions, 3600
Dobenecker, O., conductivity control, 828
Dobine, M., adsorption of acetic acid by C, 991 ; adsorption of solvent and solute, 1485
Doborzyński, D., dielectric constants of solids, 319, 2573
Dobronravin, P. P., TiO infra-red bands, 1191
Dobrotin, N., cosmic rays, 4079
Dobry, A., molecular weight of polymers, 14
Dock, E. H., thermal conductivity of H_2, 1236
Dodé, M., radioactive Cd, 4057
Dodero, M., thermo-e.m.f. of C-SiC couple, 2200
Döpel, R., canal-ray apparatus, 615
Döring, W., Barkhausen discontinuities, 1744 ; elastic modulus of Ni-Fe alloys, 3859 ; resistance of Ni, 3012 ; superheating of liquids, 266
Doermann, F. W., Lloyd's mirror, 1606
Doerner, H. A., thermal data of $CrCl_2$ and $CrCl_3$, 263
Dole, M., surface tension of solutions, 2734
Dolejšek, V., focusing of X-rays, 237 ; piezoelectric crystals, 1758 ; resolving power in X-ray spectra, 750
Donelson, J. G., thermodynamics of HCl in dioxane-water mixtures, 1689, 4597
Donoff, A., vortices, 3930
Donzowa, E. I., isotopic constitution of water, 395
Doodson, A. T., tides, 4421
Dor, L., radiative transfer, 4844
Dorfman, J., Ni-Zn alloys, 4247
Dorrestein, R., cross-section of He atoms, 4331
Dorsey, N. E., supercooling, 2931
Doss, K. S. G., contact angles, 1861
Doucet, Y., electrolytic dissociation of CdI_2, 4215
Dougherty, G., chemiluminescence, 654
Douglas, R. W., viscous deformation, 3563, 4829
Dourgnon, J., photometry and colorimetry, 4921
Dow, R. B., melting of mononitrophenols, 248
Dowling, J. J., a.c. potentiometer, 805
Drăganu, M., fast protons, 855
Dresler, A., luminosity curve of eye, 3694
Dresser, R., X-ray protection, 3410
Dreyer, H., colorimeter, 622
Drigo, A., X-ray intensity, 3290, 3291
Drikos, G., CD_4 transformations, 2949
Drossbach, P., electrolysis of molten salts, 839, 2582
v. Droste, G. F., irradiation of Th and U by neutrons, 4061
Druyvesteyn, M. J., electron beams in plasma, 3388
Drysdale, C. V., Maxwell's equations, 1335
Dubar, L., conductivity of Cu_2O, 1281
Dube, G. P., Matthiessen's rule, 5029
DuBois, E. F., heat loss from human body, 763
Dubois, J., solid friction, 503
DuBois, R., adsorption of polar molecules, 4816
DuBridge, L. A., induced radioactivity, 1951
Duchêne, R., gas flow, 3937
Duclaux, J., atmospheric soundings, 4033 ; ultra-filters, 2662
Dürichen, W., Cd electrode, 4221 ; valve electrometer, 5030
Duerr, H. H., non-screen radiography, 4704
Dufay, J., atmospheric Na, 2799, 3177, 4043 ; auroral spectrum, 1933 ; colour indices of O and B stars, 101; cometary spectra, 3132, 3574; Milky Way, 107 ; night sky, 1094
Duffendack, O. S., Geiger-Müller counters, 614, 4897
Duffieux, M., hyperfine structure, 721
Dufraisse, C., Hartley figures, 231
Dugas, R., Jacobi multiplier, 3960
Duhm, B., absorption of $CuSO_4$ crystals, 1199 ; spectra of Cr complexes, 1198; spectrum of uranyl nitrate, 4934
Duly, S. J., condensation on board ship, 2094
Duncan, A. B. F., photodecomposition of N_2O, 4096
Duncan, J. C., nebulæ, 514
Duncan, W. J., torsion and flexure of cylinders, 1807
Duncanson, W. E., wave functions, 1469
van den Dungen, F. H., resonators, 4603
Dunham, T., Jr., spectra of early-type stars, 1516
Dunkelberger, T. H., thermal data of $CdSO_4$, 3309
Dunken, H., heats of combustion, 1676
Dunmore, F. W., hygrometer, 3179 ; radio meteorograph, 1936
Dunn, C. G., analyses of steel rings, 355 ; magnetic field of parallel wires, 354
Dunning, J. R., neutron scattering, 4226; regulators for electromagnets, 887
Dunning, W. J., dielectic constants of zwitter-ions, 1718 ; dielectric properties of salt solutions, 1717 ; polar solvents, 4351
Dunoyer, L., rotating beacon, 685
Dunworth, J. V., electron pairs, 3646 ; radioactive Na, 3637
Durand, G., mass-luminosity law, 1902 ; visual binary $O\Sigma 77$, 2346

Durandin, E., wave mechanics of electron, 977
Durst, C. S., tropical storms, 1086 ; wind structure, 3613
Duschinsky, F., anti-Stokes fluorescence, 1148 ; electron spectra of polyatomic molecules, 717
Dutt, S., colour and constitution, 4464, 4903
Dutta, A. K., h.f. sound dispersion in liquids, 2101 ; thunderclouds, 4442
Dyer, W. J., colorimetry, 2413
Dželepov, B., β-spectrum of RaE, 4458 ; electron pairs, 4460

Eade, D. G., polymorphism of HgI_2, 4765
Eagle, A., relativity, 4347
Easthope, C. E., transformation in alloys, 419
Eastman, E. D., Sn-In transition, 396
Ebers, E. S., D_2CO spectrum, 2895
Ebert, H., Curie temperature, 4242 ; expansion of alloys, 1240 ; hygrometry, 2365
Éblé, L., short-wave fading, 1346
Ebster, F., high energy electrons, 2998
Eckart, C., counter circuits, 2406
Eddington, A. S., problem of *n* bodies, 2724
Edmister, W. C., thermal data for hydrocarbons, 2081
Edmunds, I. G., Ag-Zn alloys, 4295 ; superlattice in alloys, 1790
Edsall, J. T., polarisation of Raman lines, 1662
Edse, R., vapour pressure of propane, 3789
Edwards, D. L., luminosity in B-stars, 2765 ; Nova Lacertæ, 529 ; sensitometer, 3220
Edwards, E. G., glass electrode, 847
Egan, C. J., thermal data of propane, 3782 ; thermodynamics of CH_3Br, 4596
Egedal, J., magnetic inclination, 584
Egelhaaf, H., ion-counting tubes, 1274
Eggert, J., photographic sensitivity, 3683
Egloff, G., hydrocarbon research, 261
Ehmert, A., cosmic rays, 639
Ehrenfest, P. Jr., cosmic rays, 1594, 4911
Ehringhaus, A., quartz rotatory compensator, 1627
v. Eichborn, J. L., emission of Ba-coated Pt, 385
Einarsson, A. W., cloud chamber condensation, 2951
Eirich, F., surface tension, 4821
Elam, C. F., yield point, 2256
Elchardus, E., surface tension of fused mixtures, 2735
Elenbaas, W., Hg arc, 3347
Eley, D. D., solution of ions in water, 4595
Eliashevich, M., rotation energy of molecules, 1654
Ellickson, R., fluctuation, 4789
Elliott, A., Cl_2 spectrum, 1208
Elliott, N., structure of Al halides, 3890 ; structure of $Cs_2AuAuCl_6$ 3914 ; structure of SeO_2, 3046
Ellis, C. D., nuclear selection rules, 1113
Ellis, J. W., rotation of H_2O molecules, 4943
Ells, V. R., biacetyl spectrum, 4134 ; photodecomposition of Et-CO-Me, 4488
Ellsworth, J., comet Finsler, 1501 ; variable star B.D.-1°1004, 109
Elmore, W. C., magnetic structure of Co, 3019
Elsasser, W. M., H_2O spectrum, 1185, 2889, 4935 ; mean absorption of band spectrum, 3730
Elsberg, C. A., dark adaptation, 234
Elvegård, E., Se photo-cells, 1355, 2194
Elvey, C. T., interstellar nebulosities, 4401 ; μ^1 Scorpii, 2773 ; nebular spectrograph, 2749 ; night sky, 515
Emberson, R. M., Epsilon Aurigae, 2343
Emde, F., curved rulers, 4785
Emeleus, K. G., negative ions in discharge tubes, 2112
Emmanuel-Zavizziano, H., electrolysis of Pa solutions, 2581
Emmett, P. H., multimolecular layers, 1479 ; surface of adsorbents, 488
Emo, L., disintegration of deuteron, 1117
Endô, D., forces on spheres in stream, 4326 ; oxidation of Fe, 3119
Engelhard, H., aerosols, 21
Engler, O., elasticity of ferromagnetic substances, 1338
Englert, H., thermal conductivities, 3300
Entwistle, F., Atlantic flight, 3609
Epstein, P. S., cosmic rays, 2855 ; supraconductors, 1283
Erbacher, O., adsorption of ions, 3974, 3975, 4356
Erbring, H., Lloyd effect, 2252 ; spinnability of liquids, 1386
Erchova, Z. V., uranium Y β-rays, 1125
Erdélyi, A., vibration of strings, 2697, 3330
Eriksson, H. A. S., ionisation potentials, 4200
Erk, S., synthetic resins, 3504
Ernst, E., osmosis, 3497
Errera, J., intermolecular bonds, 702 ; molecular association, 2655 ; water molecules in solutions, 1193
Erschler, B., adsorption of H_2 on Pt, 3113
Erschow, A., wave mechanics of electron, 977
Esclangon, E., rotation of galaxy, 1514 ; solar-sidereal time clocks, 997
Escribano, A., densities of O_2 and CO_2, 3486 ; density of SO_2, 3064
Esnault-Pelterie, R., air-screws, 3508
Essen, L., frequency standard, 2189 ; quartz clock, 3561
Essex, H., decomposition of NH_3 by α-rays, 1960

Essin, O., overvoltage, 2146
Estermann, I., hydrogen liquefier, 272
Estey, R. S., colour temperatures, 4071
Eucken, A., atomic resistance of Pb alloys, 4638; CD_4 transformations, 2949; HBr transformation, 4995; heat capacity of fluorides, 4980; molecular heat of CH_4, 1233; thermal conductivities, 3300
Euler, H., cosmic rays, 638, 4474, 4479
Evans, C. H., latent image, 3688
Evans, D. P., glass electrode, 847
Evans, E. J., magneto-optical dispersion of alcohols, 1591
Evans, M. G., chemiluminescence, 3322; reaction kinetics, 786; solution of ions in water, 4595
Evans, Robley D., marine sediments, 4852; Ra in sea water, 4422; radium poisoning, 362
Evans, R. H., strains in stones, 2790
Evans, U. R., rusting of Fe, 2992
Evershed, J., aurora, 2371; red shift of solar D lines, 1537
Ewald, H., rare-earth spectra, 4544
Ewell, R. B., Joule-Thomson coefficients, 2085
Ewell, R. H., fluidity curves, 249; viscosity theory, 2314
Ewens, R. V. G., structure of hexacarbonyls, 4740; structures of $MoCl_5$ and WCl_6, 4741
Ewing, M., gravimetric surveys, 3074
Ewles, J., luminescent spectra, 2047, 3273
Eyring, H., chemiluminescence, 3322; liquid molecules, 4330; monomolecular films, 3122; reaction kinetics, 786
Eyster, E. H., spectra of cyclopropane and ethylene derivatives, 4528; spectrum of allene, 4529

Fabergé, A. C., torsion balance, 462
Fabian, W., calculus, 3951
Fabre, H., celestial mechanics, 2753, 3134; orbits of planets, 513; planetary systems, 512
Fabrikant, V., collisions of atoms and free electrons, 1307; excitation of atoms, 4198, 4199; excitation of Hg atoms, 200, 820; Hg discharge, 2122, 4075
Fage, A., flow in annular pipe, 2271
Faillettaz, R., anemometer, 1549; atmospherics, 1106
Fairbrother, F., dipole moment of diatomic molecule, 318
Faivre, R., structure of CdO, 3471
Fales, H. A., thermodynamic properties, 2515
Falgon, R., atmospheric O_3, 557
Falkenhagen, H., conductivity of strong electrolytes, 2566
Faltings, K., u.v. photochemistry, 4487
Fang Ssu-Mien, structure of $Na_3(B_3O_6)$, 2239
Fano, U., diffraction anomalies, 3673
Fanselau, G., lunar almanac, 3140; magnetic storm, 2816
Faraggi, N., colours of beetles, 3217; reflection of polarised light, 1624
Farevaag, P., evaporation of water, 4601
Farineau, J., Cu-Ni alloys, 3462; electron diffraction, 3002; electronic structure of metals, 3906; L spectrum of Fe, 2492
Farkas, A., H isotopes, 4098; photochemical process, 4097
Farkas, L., H isotopes, 4098; magnetic moment of deuteron, 3024; photochemical process, 4097
Farmer, F. T., ionosphere, 375, 4260
Farnsworth, A. H., stellar magnitude, 1900
Farnsworth, H. E., electron scattering, 4672
Farnsworth, P. R., vowel characteristics, 283
Farrell, J. A., evaporation of water, 4601
Farrow, J. H., X-ray dosage 3030
Farwell, H. W., dispersion without deviation, 196
Favre, A., fluid motion, 453
Fay, J. W. J., He in beryls, 1955
Feather, N., β-ray absorption, 4894; β-rays of MsTh2 and UX_2, 611; electron pairs, 3646; nuclear isomerism, 1949; proton tracks, 335, radioactive Na, 3637
Federhofer, K., spherical shells, 2696
Fedorov, E., North Polar station, 2352
Felici, N., supraconductivity, 1714, 2139, 2980
Fenn, W. O., muscular contraction, 2281
Fensch, W., structure of $BrC(CN)_3$, 4302
Ferber, M., disintegration of Po, 1121, 4062; radioactivity theory, 4445
Ference, M., transmission of electrons, 3836
Ferguson, A., liquid crystals, 3117
Ferguson, A. L., overvoltage, 2145
de Fériet, J. K., turbulent flow, 456
Ferrari, C., fluids at supersonic velocities, 52; turbulence, 4328
Ferraro, V. C. A., quaternions, 4788; solar magnetism, 4415
Ferretti, B., photoelasticity, 3502
Ferroglio, L., Venturi meters, 2701
Fessenkoff, B. G., astrophysics at North Pole, 4416; zodiacal light, 4016, 4417
Festraets, A., Stroobant cluster, 1526
le Fèvre, R. J. W., dielectric constants, 4212; dipole moments of diazoamino-compounds, 830
Fialkow, A., Einstein spaces, 1478
Field, J. E., structure of rubber solutions, 4289
Fierz, M., long-wave light-quanta, 4076; susceptibility of alums, 3023
Filippov, A., disintegration by cosmic rays, 1574
Filippov, M., u.v. emission on coagulation, 3215

Finbak, C., atomic distances in molecules, 2652
Finch, G. I., crystal growth on calcite, 2248 ; surface structure, 4362
Finck, J. L., states of equilibrium, 2518
Findlay, J. C., sound velocity in He, 4606
Fink, P., CH_3Br spectrum, 222
Finkelnburg, W., boric acid continuum, 4548 ; Cs spectra, 1646
Finkelstein, B. N., two-quantum states of H_2^+, 220
Finn, A. E., electric polarisation, 4650
Finn, A. N., optical glass, 684
Finzi, A., gravitational equations, 3540
Fischer, E., Hg discharge, 2417
Fischer, F., galena light detector, 2196
Fischer, H., fluorescence of methyl acridone, 2862 ; glow discharge, 2121, 4625 ; stellar magnitudes, 1882
Fischer, J., heating of conductors, 2202, 3042, 4579
Fischer, L. J., photoelasticity, 2259
Fischer, V., CO-N_2-H_2 isotherms, 2083 ; heats of mixture, 3310
Fischgold, H., nerve currents, 5065
Fisher, R. A., interferometer mirrors, 659
Fivet, J., end correction of tube, 2315
Fjeldstad, J. E., tidal observations, 1539
Flammersfeld, A., β-spectrum of RaE, 609
Fleischer, H., conductivity of strong electrolytes, 2566
Fleischer, R., photo-effect in oxide kathodes, 378
Fleischmann, R., neutron absorption in B and Li, 2157 ; nuclear investigations, 388
Fleming, J. A., Carnegie Institution of Washington, 1110 ; earth's magnetism, 3185 ; magnetic survey, 1566
Fletcher, H., mechanism of hearing, 4188 ; noise, 2538
Flexser, L. A., spectra of acetophenone derivatives, 2465
Flint, H. T., 4 gm. radium unit, 1342 ; fundamental particles, 332 ; new quantum theory, 975 ; photon-electron analogy, 4470 ; unit of electric charge, 2152
Flood, H., thermal data of vanadium oxytrichloride, 765
Flügge, J., spherical mirror, 676
Flügge, S., nuclear reactions, 2394
Foch, A., end correction of tube, 2315
Fock, V., eigen-time, 472
Focke, A. B., acoustic filters, 3327 ; sound velocity in Bi, 2100
Förster, T., spectra of aromatic hydrocarbons, 4958
Försterling, K., optical constants of metal films, 1169, 4504
Foëx, G., ionisation of atoms in alloys, 2170
Fokker, A. D., stresses due to sound waves, 1254 ; waves in liquids, 2091
Forbes, G. S., photolysis of H_2S, 3676
Forbush, S. E., cosmic rays, 4477
Ford, L. H., calibration of condensers, 2109 ; capacitance, 1721 ; inductometer, 3027
Fordham, S., surface structure of Hg, 83
Forester, G. O., nuclear moment of Cu, 4121 ; nuclear spin of I, 4521
Fornwalt, H. J., viscosity of MeOH, 3566
Forrer, R., magnetite, 4241 ; orbital interaction in elements, 4984
Forsman, K. E., voltage stabiliser, 2977
Forsythe, W. E., heterochromatic photometry, 3693
Fortier, A., end correction of tube, 2315
Fortrat, R., monochromator, 2478
Foster, E. W., complex spectra, 1187
Foster, J. S., spectrum analysis, 2017 ; Stark effect in A and Kr, 1218
Foster, L. V., polarising illuminator, 2438, 2439
Fournier, G., electronic atmospheres, 2204 ; structure of matter, 4270
Fourt, L., electrophoresis, 920 ; viscosity of monolayers, 4825
Fowler, R. H., parachors, 994 ; reaction kinetics, 786 ; statistical mechanics, 3527
Fowler, W. A., electron and positron scattering, 4671 ; γ-radiation from B, 1957
Fox, F. E., sound field of quartz disc, 3792
Fox, G. W., X-ray diffraction in quartz, 747
Fox, J. J., absorption of CH_2, 3710
Fränz-Gotthold, I., diffraction theory, 4484
v. Fragstein, K., Christiansen filters, 1968
Franchetti, S., energy of γ-rays, 612
François, F., Raman effect of ZnI_2 and CdI_2 solutions, 1221
Franczak, S., susceptibility of alloys, 4246
Frank, A., transitions of solid CH_3D and CD_4, 782
Frank, F. C., condensed phases, 5000 ; liquid crystals, 3483
Frank, I. M., electron pair creation, 3647, 3648, 3649
Frank-Kameneckij, D. A., flame propagation, 4588 ; free convection, 761, 3764 ; thermal explosions, 3765
Franke, W., $COCl_2$ formation, 2868
Frankenburger, W., u.v. dosimeter, 2627
Franzini, T., photon tube, 4232 ; protons from hydrogenated Pd, 3428
Fraser, M., thermoelectric effects, 3041
Frazer, J. H., susceptibilities of complex compounds, 3853
Frazer, R. A., differential equations, 2277
Fred, M., Th spectrum, 1636

Fredendall, G. L., glow to arc transition, 4197

Fredenhagen, K., theory of solutions, 2087 ; two-component systems, 2729

Frederick, J. R., X-ray diffraction in quartz, 747

Frederick, K. J., heat data of I_2, 3295 ; thermal data for $TeCl_4$, 4979

Freivert, S., night sky, 4040

French, H. S., tertiary amine oxide double bond, 672

Frenkel, J., diamagnetic cyclic molecules, 881 ; electron orbits, 2709 ; emulsoidal systems, 2228 ; plastic deformation, 1812

Frerichs, R., isotopes in diamond, 1372

Fresa, A., equatorial micrometer, 3985

Freundlich, H., dilatancy, 917 ; effect of h.f. sound on viscosity, 2220 ; gels, 17

Frevel, L. K., X-ray powder spectroscopy, 437

Freymann, M., spectra of amines, 703

Freymann, R., H bonds, 3728 ; Raman spectrum of HCl, 4550 ; reflection spectra, 4949 ; spectra of HCl solutions, 704

Fricke, E. F., sound absorption in CO_2, 4616

Fricke, H., X-ray activated water, 2919

Fricke, R., colloidal Au, 2232 ; lattice distortion and particle size, 2490 ; pyrophoric Fe, 2940

Fricke, W., distribution of nebulæ, 3581, 3988 ; extra-galactic nebulæ, 2326

Fried, B., CuII and rare-gas configurations, 4941 ; theory of complex spectra, 4940

Friedrich, W., γ-ray measurement, 4255

Friend, A. W., velocity of sound, 2956 ; vibrations of plates and membranes, 3328

Friend, J. N., intermolecular forces, 3443

Frieser, H., colour photography, 1616

Friess, H., aerosols, 21

Frilley, M., Ac γ-rays, 2400

Frimberger, F., viscosity of suspensions, 3897

Frisch, O. R., neutrons, 2595

Frivold, O. E., refraction of H_2S and D_2S, 2445 ; susceptibility of Sm^{+++}, 4248

Fröhlich, H., nuclear forces, 2206

Frössling, N., evaporation of drops, 1091; falling sphere, 53

Frola, E., wave equation, 3946

Froman, D. K., cosmic rays, 1981, 3211, 4908

Frumkin, A., adsorption of H_2 on Pt, 3113 ; Hg solution boundary layers, 3558 ; H_2 overvoltage, 849

Fry, E. M., freezing point apparatus, 766

Fuchida, T., subterranean structure, 4024

Fuchs, F., u.v. dosimeter, 2628

Fuchs, K., condensing systems, 2719 ; conductivity of metal films, 1276

Füchtbauer, C., broadening of Na lines, 4119

Fünfer, E., disintegration of N, Al and A, 3633 ; nuclear transformation, 595

Fürst, U., Mn-Bi, Co-Sb, Ni-Sb systems, 3464

Fürth, R., Brownian motion, 1828 ; dimensions, 3522 ; liquid crystals, 2245

Fues, E., dimensions, 967 ; light diffraction by h.f. sound, 3334 ; space-lattice diffraction, 3335

Fujioka, Y., HgH and HgD spectra, 4135

Fujita, Y., carbon stars, 1907 ; stellar atmospheres, 3997

Fujiwara, T., Al single crystals, 4308 ; elasticity of hot wires, 1419 ; microcrystals in Al wire, 1398 ; X-ray reflection by crystals, 4570

Fujiwhara, S., stress tensor, 452

Fukuda, M., atomic rays, 3940

Fukuroi, T., action of substances on photographic plates, 3219 ; metallic film, 1865

Fukusima, M., absorption of H_2 and N_2 in Fe, 4811

Fuller, G. R., spreading of drops, 492

Funk, W., positive column, 4622

Fuoss, R. M., conductance of lead abietate, 5035 ; dielectric constants of compounds, 3817 ; electrical properties of solids, 1720

Furner, H. H., α Ursæ Majoris, 1060, 2344

Furry, W. H., neutral particles, 3532

Futagami, T., thermo-luminescence of quartz, 3669

Gabler, F., compensator, 4499

Gaddy, V. L., compressibilities of gases, 4998

Gaedcke, W., electron lens, 3841

Gaerttner, E. R., γ-radiation from B, 1957

Gailer, K., collisions between He or H and alkaline earths, 2481 ; disintegration of Ne, 4886 ; spin conservation law, 2972

Galibourg, J., subpermanent deformations, 3924

Gall, D. C., low-resistance bridge, 3356

Gallagher, D. M., monofilms of barium stearate, 2742

Gallais, F., magnetism of mercuri-iodides, 885

Gallarati, G., electron microscopes, 342

Gallaugher, A. F., surface tension of glycols, 1488 ; vapour pressures of glycols, 1690

Gallissot, M., thermomagnetic anomaly, 3021, 4234

Galloway, W. R., sparking potential of Hg vapour, 1267

Gamertsfelder, C., X-ray screens, 2489
Gamow, G., star model, 1524; stellar energy, 3999; stellar evolution, 1909
Gandolfo, S., total reflection, 4496
Gangopadhyaya, S., dielectric constants of ionised gases, 2984
Ganguli, A., hydrous oxide sols, 4753; theory of liquids, 2684
Ganguly, P. B., viscosity of mixtures, 3126
Gans, F., excited Xe, 2416
Gaposchkin, S., stellar magnitudes, 1896; variable stars, 1062, 1063; VV Cephei, 1528; WZ Ophiuchi, 1918
Garbatski, U., magnetic moment of deuteron, 3024
Garcia, G., ballistics, 4793; gravitation, 1817; relativistic dynamics, 2280
Gardner, M. E., recombination of ions in O_2, 1700
Garman, R. L., analytical balance, 3944
Garner, W. E., photosensitisation, 3684*
Garnier, R., molecular diffusion of light, 3675
Garrigue, H., air temperature, 1546; aurora, 1555
Garton, W. R. S., spectrum analysis, 1181
Gaspart, R., water molecules in solutions, 1193
Gasser, H. S., biological activity, 2182
Gassmann, F., vibrograph, 1562
Gatterer, A., spectrocomparator, 3744
Gatty, O., electrocapillarity, 2745; surface pH, 2744
Gaubert, P., liquid crystals, 427, 939, 2244
Gaudry, H., flame propagation, 3312
Gauzit, J., atmospheric Na, 2799, 3177, 4043; auroral spectrum, 1933; Comet Finsler, 1010, 1887
Gavoret, J., isoelectric point of cellulose, 2224
Gaydon, A. G., CdF spectrum, 3727; MnH spectrum, 1652; u.v. colour sensation, 3753
Gdaliahu, M., flow in conduits, 3514
Gdanow, A., disintegration by cosmic rays, 1574
Gebauer, R., Stark effect, 2905
van Geel, C., Geiger counter, 3348
Géhéniau, J., photon-electron interaction, 3658; photon wave mechanics, 1973
Gehman, S. D., structure of rubber solutions, 4289
Geiger, H., cosmic rays, 636 1596, 4910
Gelbart, A., synthesis of NH_3, 822
Geloso, M., electrodeposition of Cu, 2580
Gemant, A., dielectric losses, 1296; fluid motion along tube, 4783; fractional differentials, 1454; friction in dielectrics, 5042
Gemelli, A., vowel structure, 284
van Gemert, A., cosmic rays, 4475, 4912
Gens, C. M., tertiary amine oxide double bond, 672
Gentner, K., kathode rays, 2155
Gentner, W., cosmic rays, 593; γ-ray scattering, 150
George, F., Cs spark spectra, 688
George, W. D., 1-second intervals, 4372
George, W. H., similarity, 3098
Gerassimoff, T., adsorption of O_2 by Ag, 3971
Gerlach, W., metallurgical problems, 3404
Germer, L. H., molecular layers, 2310
Gerö, L., CO spectrum, 3258, 3259, 3260, 3269; dissociation energy of CN, 1649; energy states of diatomic molecules, 4546,
Gershinowitz, H., infra-red spectrometer, 2052; spectra of cis- and trans-butene-2, 2463
Gersun, A. A., luminous field, 4920; photometric invariant, 1619
Gerthsen, C., He canal rays, 295
Gesteau, P., spectrograph, 3742; spectrum analysis of solutions, 3240
Getting, I. A., two-pulse oscillator, 365; valve counting circuit, 299
Gex, M., naphthalene spectrum, 3722
Ghali, M. M., dielectric constants of rocks, 1928
Gherzi, E., cyclones, 4037
Ghosh, B., conduction in rare-earths, 4637
Ghosh, B. N., spreading of liquids in thin filter paper, 4371
Ghosh, I. C., conductivity of fluorescent solution, 4549
Ghosh, K., conduction in rare-earths, 4637
Ghosh, M., scattering of particles by atoms, 340
Ghosh, R. N., clarinet, 1257; stresses in moving fluid, 2263
Giacomello, G., structure of KHF_2, 3913; structure of long-chain acids, 2242; terpene structure, 2682
Gialanella, L., meridian observations, 1510; moving stellar groups, 1536, 4413
Gianasso, R., sound velocity and melting point, 2095
Giào, A., atmospheric circulation, 1548
Giauque, W. F., adsorption of He, 1857; induction heaters, 2079; resistance thermometer heaters, 2937; temperature scale below 1° K, 2078; thermal data of N_2O_4 and NO_2, 1249; thermal data of SO_2, 3294
Gibson, E. S. H., spreading of drops, 492
Gibson, K. S., spectrophotometer, 4966
Gibson, R. E., refractive index of benzene, 1811
Giese, A. C., u.v. sublethal effects, 2629
Giesebart, K., radii of curvature, 3941
Gilbert, C. W., disintegration of B, 2390; proton tracks, 334
Gilbert, J., ballistic galvanometers, 1339
Gill, E. W. B., theory of electrical discharges, 4190; thermionic emission, 1359

Gill, H. V., continental drift, 1932
Gillings, D. W., effect of h.f. sound on viscosity, 2220
Gillod, J., photo-cell, 3423
Gilmann, H. H., Raoult's law, 3790; vapour-liquid equilibrium, 3788
Gilmer, T. E., integrating power of the eye, 182
Gingrich, N. S., allotropy of P, 4742; atomic distribution in liquid Na, 1409; structure of liquid K, 3484; X-rays screens, 2489
Ginnings, P. M., solubilities of hexanols, 3107
Giorgi, G., Rogowski magnetometer, 4697
Girard, P., chemical affinity, 403; dipole rotation, 5038; electric sparks, 288; ultrasonic centrifuge, 3455
Givord, M., Cs spark spectra, 688
Gladisch, H., viscosity of gases, 502
Glaser, G., photoelectric current in alkali halides, 380
Glaser, W., electron lens, 4229
Glasgow, A. R., Jr., rectifying columns, 271
Glasser, O., mitogenetic radiation, 1754
Gleissberg, W., constitution of stars, 1044, 2772; model star, 106; stellar structure, 4000
Glemser, O., dielectric constants of suspensions, 3368
v. Gliszczynski, S., fluorescence of calcites, 1147
Glocker, R., X-ray measurement of strain, 4974
Glockler, G., apparatus for Raman effect, 4560; reflection and absorption in KCl-CuCl$_2$, 2442
Glotov, I. I., ionisation in Ne and Ne-A mixtures, 294, 2123; Ne discharge, 293
Gluchow, P. G., fluorescence depolarisation, 163
Glückauf, E., He in beryls, 1954, 1955
Gmelin, P., pressure multiplier, 958
Go, Y., fibre structures, 1775
Gobrecht, H., fluorescence of rare earths, 1216; rare-earth spectra, 2455; TuIV spectrum, 2454
Gockel, H., Schuler clock, 3560
Godart, O., cosmic rays, 1982
Godfrey, G. H., atmospheric radiation, 119
Godward, L. W. N., valency of Ru, 4276
Goebel, H. L., dielectric properties of acetylenic compounds, 316
Goeppert-Mayer, M., excited levels of benzene, 4547; neutron-proton interaction, 3384
Görlich, P., photo-kathodes, 1353, 1354, 3424
Gørrissen, J., thermal data of vanadium oxytrichloride, 765
Goetz, A., X-ray spectrograph, 1231
Götz, F. W. P., atmospheric O$_3$, 4855
Gogate, D. V., Cd line 6438 Å, 4116; Joule-Thomson effect, 2511, 3779
Golay, M. J. E., flow meter, 960
Golaz, C., wind velocity, 2796
Goldberg, H., conductivity cells, 5036
Goldberg, L., self-consistent field for Fe, 1842; solar reversing layer, 1535
Goldet, A., birefringence, 4468
Goldfeld, J., adsorption theory, 75
Goldsbrough, G. R., seiches in a strait, 114
Goldstein, L., activated nuclei, 4052; electron affinity, 2971; ionisation chamber, 1965; neutron-proton showers, 1369; nuclear collisions, 2596; nuclear excitation, 3631; nuclear reactions, 902
Goldstein, S., turbulence, 954, 3512
Goldwasser, S., manostat, 2722
Gollnow, H., rotational states, 2467
Goltz, H. L., Ra dosage, 3867
Gombás, P., constants of Sr and Ba, 1394; metallic bond, 1766
Gomes, R. L., Dirac matrices, 62, 1835
Goobar, S. V., gyromagnetic effect, 3860
Goodale, H. I., short distance therapy, 1749
Goodeve, C. F., CH$_3$Br spectrum, 222; photosensitisation, 1999, 3684; photosensitivity, 2869; spectra of alkyl iodides and bromides, 1655; thermochemistry of HClO$_4$, 769; thixotropy, 1385; visual purple, 744
Goodeve, J. W., spectrum of methyl methacrylate, 4951
Gooding, E. J., strain testing in glass, 4778
Goodwin, T. H., crystal structure analysis, 2667; structure of pentaerythritol tetracetate, 936
Gordadse, G. S., quantum theory of LiH$^+$, 469
Gordeladse, S. G., diffuse nebulæ, 4387; novæ, 4407, 4408, 4409
Gordon, A. R., free energy of C$_2$H$_2$, 2088; transference numbers, 3376
Gordon, R. R., H$_2$O$_2$ spectrum, 4125
Gordy, W., absorption of OH group of phenol, 709; infra-red absorption of H bonds, 2036
Gorham, J. E., nuclear moments, 2026
Gorman, M., dipole moments of unsaturated compounds, 1719
Gorodetzkaja, A., Hg electrode, 5047, 5048
Gorodetzky, S., coincidence detector, 2405; counting circuits, 3654; nuclear reaction Be (α, n), 597
Gorodezkaya, A., Hg solution boundary layers, 3558
Gorškov, G. V., identification of Ra, MsThI and RdTh, 592
Gorter, C. J., irreversible processes, 3321; paramagnetism, 884, 3403, 4244, 5060
Gortner, R. A., electric moments, 3123

Goss, F. R., solvent effect on dipole moments, 831
Goto, R., positive ion emission from Ni, 898
Goubeau, J., vibrations of ethane, 4126
Gough, H. J., failure of metals, 3071; steel fracture, 1816
Gouguell, B. M., adsorption theory, 3967
de Graaf, J. E., X-ray tube, 4155
Grabau, M., polaroid, 670
Grace, A., photo-cell relays, 2195
Graef, C., magnetic dipole, 3393
Graff, K., bright stars in Cassiopeia, 2764; colour of stars, 1036, 1037; star distribution in Orion, 1021
Graham, C. H., brightness discrimination, 3749
Graham, R. S., equation solver, 4791
Grahame, D. C., distribution between phases, 4814; neutron scattering, 3007
le Grand, Y., galvanometer, 3815
Grandmontagne, R., night sky, 4038, 4039
Granick, S., duroquinone system, 3852
Grant, C. K., geophones, 2784
Grant, K., spreading of drops, 493
Grassi, U., dielectric constants of BCl_3, and $AsCl_3$, 2571
Grassmann, E., artificial radioactivity, 3192
Graton, L. C., microcamera, 178
Gratsiatos, J., electron lens, 343
Gratton, L., galactic clusters, 1052
Grauwin, P., thermionic emission of thoriated Mo, 1362
Gray, G. H., conductivity cells, 5036
Gray, L. H., radiation dosimetry, 361
Greaves, W. M. H., coil magnetometer, 3188; γ-Cassiopeiae, 2769; right ascensions, 536
Green, A. E., plate gliding on stream, 2266; pressure in turbulent fluid, 4782
Green, J. B., Zeeman effect in spectrum of neon, 4963
Greenstein, J. L., colour indices of stars, 1903; interstellar absorption, 4002; spectra of B stars, 1518; stellar absorption coefficient, 1039; stellar luminosity, 3595; stellar magnitudes, 2328
Greenwald, H. P., ground movement in mines, 4029
Gregg, W. R., international meteorology, 1937
Grégoire, R., composition of matter, 4271; elements 43, 61, 85 and 87, 2651
Gregory, C. C. L., Super-Nova 145. 1937 Persei, 1531
Greinacher, H., ions in air, 579; spark-counter, 2403; wave theory demonstrations, 658
Gremmer, W., current balance, 2976; Mn ferrites, 2562
Grenet, G., seismographs, 1941
Gribkova, S., flame propagation, 2947
Gribnau, F. B., light scattering in colloids, 913, 1771
Grieger, H., air-earth current, 580
Griffith, B. A., two-dimensional flow, 3079
Griffiths, E., heat insulators, 2502; refrigeration, 1244; thermal conductivity of mica, 246
Grimmett, L. G., model for Ra therapy unit, 2631; nuclear physics and medicine, 1752
Grinbaum, R., u.v. absorption by organic substances, 223
van der Grinten, L., reflex copying, 4493
Grisollet, H., light scattering in air, 3622
Grivet, P., measurement of short intervals, 1494; new photo-cell phenomenon, 3422
Grivet-Meyer, T., cosmic rays, 1983, 3212
Grobe, H., absorption of supersonics in liquids, 2535
Grönblom, B. O., atomic nuclei, 900; Hartree nuclear model, 3883
Groff, J., viscosity, 1875
de Groot, W., neutrons, 3833
Grošev, L. V., electron pair creation, 3647, 3648, 3649
Gross, A., explosion of C_2H_2, 3313
Gross, B., anomalous dielectric, 2578; cosmic rays, 2858
Gross, E., light scattering by crystals, 1611
Gross, M. J., X-ray protection, 1748
Gross, P., activity coefficients, 853; Raoult's law, 3790
Gross, P. M., Henry's law, 1691; dipole moments of unsaturated compounds, 1719
Gross, S. T., structure of cellulose, 3451
Groth, W., photo-decomposition of CH_4, 1155; u.v. photochemistry, 4486, 4487
Grotrian, W., solar granulation, 543, 3599
Grouiller, H., astrophotometry, 2334
Grover, H., Mo positive ions, 387
Groves, L. G., dipole moments of vapours 829, 4210
Grube, G., Ba alloys with Bi, Mg and Pb, 4639; binary alloys, 3809; electrolysis of Na_2SO_4, 4659; electrolytic oxidation of Rh, 2586; Ni-Mo alloys, 3847; polarisation of Ni anode, 3378
Grüneisen, E., conductivity of pure metals, 2615, 2616
Grumbach, A., discharge from capillary, 1873
Grundström, B., TlH spectrum, 2043
Gruner, P., brightness of sky, 4866; purple light, 124; twilight, 4867
Gryglewicz, S., fluorescence of anthracene, 648

Guareschi, P., compressibility of solids, 2257; molecular heats of liquids, 1827; molecular potential energy, 1826; thermal conductivity of gases, 2499

Guastalla, J., small surface tensions, 2301

Gudden, B., galena light detector, 2196

Guderley, G., oscillations in burning gases, 4990

Gudmundsen, J. G., structure of cyclohexane and derivatives, 3892

Guében, G., artificial disintegration, 1111

Günther, P., chemical activity of ions, 2920

Güntherschulze, A., anode glow, 3345; electrolytic valve anodes, 851; glow discharge, 816, 817, 2968, 2969; positive column, 4194

Guéron, J., spectra of HCl solutions, 704

Güssow, M., monochromator, 1008; stellar photometry, 3129

Güttner, W., HBr transformation, 4995

Guggenheim, E. A., activity coefficients, 482; reaction kinetics, 786

Guha, B. C., structure of anthraquinone, 3481

Guild, J., optical instruments, 1632

Guillemin, J., birefringence, 4505

Guillet, A., measurement of "g", 450, 4780; multiple reflection, 3698

Guillien, R., dielectric constant of CS$_2$, 2576; dielectric constant of liquid N$_2$, 4211; Kerr constants of liquefied gases, 624

Guilmart, T., reflection spectra, 4131, 4949

Guinier, A., colloidal suspensions, 2660; X-ray diagram, 3057

Guizonnier, R., earth's electric field, 4051

Gulatee, B. L., figure of earth, 4017

Gumbel, E. J., radioactive intervals, 589

Gunn, R., amplification of thermo-e.m.fs, 4733; inductor-compass, 588

Gunther, P., life of gaseous ions, 298

Guntsch, A., MgH band, 4954

Gupta, J., δ(CH) vibration in sodium formate, 725; heat-capacities of crystals, 3293; hexacoordination, 4275; origin of Raman lines, 2909

Gupta, R. P., anomalous dispersion, 681

Gurevich, G., elastic deformation, 46

Gurevich, I., disintegration by cosmic rays, 1574; nuclear energy levels, 390

Gurevich, J. J., neutron absorption, 3008

Gurney, R. W., conduction in polar crystals, 1708; electrolytes, 1300; forces between ions, 4216; latent image, 665

Gussmann, W., wetting of pigments, 1860

Gustafson, T., ocean currents, 2351; proper energy of electron, 2996

Gutenberg, B., earth's core, 2378; seismic waves, 1101, 4437

Guth, E., Stefan's law, 3209

Guthnick, P., Boss 5442 (V389 Cygni) 1065

Gvosdover, S., ion layer around probe, 2113; positive column, 2970; probe electrodes in contracted discharge, 811

Gwinner, E., K-lines of B, 240; Lα and Lβ lines of elements Fe to Ge, 2060

Gysae, B., contact potential, 4684

Haag, J., relaxation oscillations, 2260

Haalck, H., earth's magnetism, 1946; static gravimeter, 4322

Haas, A. E., black-body emission, 2847; dimensionless constants, 3956; Stefan's law, 3209

Haas, W. H., lunar changes, 4389

de Haas, W. J., conductivity of W single-crystal, 2501; electrical resistance of Au, 2136; heat conduction in crystals, 760, 2071, 3762; magnetic rotation, 4073; paramagnetic relaxation, 3854

Haberlandt, H., luminescence of fluorites, 165

Hachkovski, V., quenching of fluorescence, 161

Hacker, S. G., Arcturus spectrum, 3149

Haenny, C., cosmic rays, 1138

Haffner, H., Praesepe cluster, 4839; variable star in Praesepe, 110

Hafstad, L. R., nuclear α-particle model, 4735; proton scattering, 1311; transmutation of Li, 4889

Haggard, H. W., electrical studies of living tissue, 1745

Hagihara, Y., n-body problem, 3989; planetary nebulae and Novae, 1533

Hahn, O., disintegration of Th, 3640; report of Committee on Atoms, 394; surface phenomena, 3559; trans-Uranium series, 3639

Hahn, O. T., Cs spectra, 1646

Haidlen, E., vaporisation of SO$_2$, 790

Haïssinsky, M., electrolysis of Pa solutions, 2581

Haig, C., visual purple, 3754

Hailer, C., canal rays, 2973

v. Halban, H., strength of acids, 330

v. Halban, H., Jr., neutrons, 2595; photoneutrons from Be, 2602

Halbwachs, F., numbering α-particles, 2396

Hale, J. B., COCl$_2$ spectrum, 710; structure of CF$_4$ and SiF$_4$, 3891

Halford, J. O., exchange of D between CH$_3$OH and D$_2$O, 4598; Raman spectra of CH$_3$OH, 229

Hall, A. A., turbulence, 3511

Hall, E. H., magnetic effects, 1320, 3011

Hall, H. W., rotating thread, 1424

Hall, J. S., magnitudes of G-stars, 4392

Hall, W. C., thermal conductivities of Hg and Na, 3298

Hall, W. M., units, 968

Halla, F., Mn-Bi, Co-Sb, Ni-Sb systems, 3464
Halpern, J., neutrino, 2843
Halpern, O., neutron scattering, 866
Hamaker, H. C., attraction between particles, 406
Hamel, G., seepage of water into soil, 1543
Hamer, W. J., calomel half-cells, 1725
Hamers, J., refractive index of CO_2, 194
Hamid, A., magnetism of Cr compounds, 4696
Hamilton, R. A., high-latitude radio observations, 1755; North-East Land expedition, 2366
Hammann, G., heat conduction of liquid O_2 and N_2, 4165
Hammen, H., conductivity of Cu_2O, 3359
Hammer, A., thermo-e.m.f. of Ni, 1365
Hammerschmid, H., u.v. dosimeter, 2627
Hammett, L. P., reaction kinetics, 786; spectra of acetophenone derivatives, 2465
Hammick, D. L., electric polarisation, 4651
v. Hámos, L., X-ray micro-analyser, 1670
Hampson, G. C., electric polarisation, 4650, 4651; structure of As_4O_6, P_4O_6, P_4O_{10}, and $(CH_2)_6N_4$, 3888
Hampton, W. M., floodlight beacons, 3747; photometry of projectors, 2436
Hancock, H., densest lattice, 2235
van den Handel, J., magnetic rotation, 4073
Hanle, W., excitation of gases, 1703; H and D canal rays, 819
Hansen, G., optical resolving power, 3229; photographic graininess, 3221; Scheiner and DIN degrees, 1158
Hansen, L. A., cellulose-water system, 18; water in wood, 1487
Hanson, E. T., shadow of straight edge, 1153
Haque, A., space-group of creatinine, 3482; structure of benzophenone, 3060
Harang, L., auroral heights, 122; ionosphere, 374
Harasima, A., kinetic theory of liquids, 1442
Harders-Steinhäuser, M., structure of dental enamel, 2243
Hardy, A. C., 3-colour photography, 4101
Hardy, H. C., vibration of plates, 444
Hardy, J. D., heat loss from human body, 763, 764; human body temperature, 254
Hardy, R., crystal structure analysis, 2667; structure of pentaerythritol tetracetate, 936
Hardy, T. C., adiabatic change of magnetisation, 3848
Hargreaves, F. J., telescope, 506
Harker, D., ionisation constants, 4660
Harkins, W. D., film balances, 89; report of Committee on Atoms, 394; surface tension of soap solutions, 79; viscosity of monolayers, 4825
Harned, H. S., ions in solution, 3103; thermodynamics of HCl in dioxane-water mixtures, 1689, 4597
Harper, D. R., heats of combustion, 4987
Harper, W. E., Nova Lacertæ, 1914; orbits of H.R. 5472, 2763; stellar radial velocities, 2762
Harris, M., elasticity of wool, 20
Harris, N. L., electric discharge lamps, 2871
Harris, P. M., diffusion of Li ions, 40; X-ray tube, 1230
Harrison, E. P., magnetometer, 1567
Harrison, G. B., three-colour photography, 666, 3226
Harrison, G. R., Cell spectrum, 691; comparator screws and scales, 962; spectrum analysis, 3703; spectrum interval recorder, 4151
Harrison, S. F., condensing systems, 979
Harrison, W. N., surface tension of enamel, 4359
Hart, E. J., X-ray activated water, 2919
Hart, H. C., mechanical solution of equations, 466
Harteck, P., adsorption, 3548; estimation of D_2, 794; radio-As, 3194; u.v. photochemistry, 4486, 4487; vapour pressure of propane, 3789
Hartig, H. E., transverse sound waves, 5006
Hartley, G S., diffusion of KCl in water, 4772; paraffin-chain micelles, 4773; transport numbers of paraffin-chain salts, 5045
Hartline, H. K., optic nerve, 2055, 3750
Hartmann, W., action of glottis, 2963
Hartree, D. R., self-consistent field, 2718; self-consistent field for Ca, 471; wave functions, 4801
Hartree, W., self-consistent field, 2718; self-consistent field for Ca, 471; wave functions, 4801
Hartshorn, L., electric breakdown, 1295; electrical insulators, 3371; models of dielectrics, 4209; resistance measurement, 1280
Hartshorne, N. H., polymorphism of HgI_2, 4765
Hartwig, G., colour temperature of stars, 102
Harvey, A., PbS bands, 2044
Harvey, E. N., brain potentials, 359, 2181; protoplasm, 1782
Harvey, G. G., structure of MeOH, 1410
Harvey, K. F., nitrogen afterglows, 4483
Harwood, M., DF Cygni, 1064
Hasegawa, M., diurnal magnetic variations, 583, 1945
Haskins, C. P., biological effect of kathode rays, 4722; biological effects of X-rays, 4706; monofilms of barium stearate, 2742

Hass, G., metal films, 1490
Hass, W., temperature of incandescent kathodes, 3307
Hassel, O., atomic distances in molecules, 2652, 4279; molecular structure of $C(CH_2X)_4$ (X=Cl, Br or I), 935; refraction of H_2S and D_2S, 2445; structure of cyclohexane and derivatives, 3892, 4303; structure of ZnI_2 and CdI_2, 1377
Hasunuma, H., H_2 spectrum, 2042; isotope displacement in W lines, 1188
Hatch, G. T., disintegration of Be, 3641
Hatcher, W. H., conductivity of H_2O_2 and HNO_3, 4640
Hatschek, E., viscosity of liquids, 90
Hauer, A., electron diffraction patterns, 3837
Hauk, V., mass-spectrograph, 2551, 3350 5026; tension in rubber, 3923
Haul, R., surface films, 4364
Hauptman, E., CS_2 spectrum, 3713
Haurwitz, B., air pressure, 1082; atmospheric oscillations, 563
Hautot, A., electron beam, 2598; internal potential of crystals, 417, 2685
Havelock, T. H., flat plate in stream, 2269
Hawke, E. L., tornado, 4857
Hawkes, J. B., magnetic double refraction in esters, 625
Haworth, F. E., focusing of X-ray beam, 2058; superstructure in $FeNi_3$, 4761
Haworth, L. J., disintegration of Li, 3198, 3199; nuclear research apparatus, 616
Haxby, R. O., disintegration of Be, 140
Hay, R., viscosity of slag systems, 1877
Hay, R. H., optical resolution, 4567
Hayden, H. S., h.v. X-ray distribution, 2630; structure of human bone, 1408; X-ray filters, 4711, 4712
Hayner, L. J., shot effect, 382
Haynes, B. C., wind forecasting, 2795
Hazel, F., colloidal silicic acid, 1777
Hazelhurst, T. H., drops on liquid surfaces, 495
Hazlewood, E. A., O parameters in $NaIO_4$, 1402
Hazzard, G., heat conduction in liquids, 3299
Heaps, C. W., magnetic viscosity, 3849
Heard, J. F., γ-Cassiopeiae, 4390
Hebb, M. H., β-decay, 3645; nuclear isomers, 3044
Hecht, S., adaptometer, 3285; vision, 2483; visual purple, 2486
Heck, C. M., snowflakes, 1550
Heck, N. H., seismological problems, 1557; submarine geology, 3183
Heckmann, O., Praesepe cluster, 4838, 4839; stellar photometry, 4833
Heidenreich, F., X-ray protection, 4254
Heilemann, J. J., l.v. He arc, 3244
Heimann, G., broadening of Na lines, 4119
Heinrich, G., suction pumps, 4803
Heinze, W., contact potential and exit-work, 4266; oxide kathodes, 4732; temperature of incandescent kathodes, 3307
Heisenberg, W., cosmic rays, 4474; elementary particles, 2713; passage of particles through atomic nuclei, 2999; quantum theory limitations, 4345
Heitler, W., cosmic rays, 2857; nuclear forces, 2206
Heller, G., van der Waals forces, 405
Heller, W., birefringence of sols, 408; colloidal goethite, 924; non-spherical colloidal particles, 915; sol →gel transformations, 3447; thixotropy, 16, 914
Hellmann, H., electron affinities, 2029; polarisability of atoms and ions, 65
Hellström, H., efficiency of fluorescence, 1149
Hellwege, K. H., calcium subfluoride, 2944
Hély, J., unified field theory, 478
Hemmendinger, H., eclipse equipment, 1006; pantograph, 3232
de Hemptinne, M., critical potentials of CO, 2547; Raman spectra of deuteroethylenes, 2911
Hendershot, O. P., X-ray crystal photographs, 39
Henderson, M. C., cyclotron, 617
Hendricks, J. O., halogen films on W, 386
Hendricks, S. B., structure of talc and pyrophyllite, 3059
Henglein, E., system Ni-P, 3463
van Hengstum, J. P., Cd spectrum, 1640
Henkes, R. A., freezing points of hydrocarbons, 1241
Henneberg, W., electron optics, 3009
Henninger, F. P., resistance of Cu_2O, 2569; resistance of Se, 2130
Henriques, F. C., Jr., photodecomposition of N_2O, 4096
Henry, D. C., kataphoresis, 3898
Henson, A. F., deposition of O_2 upon W, 1364
Henyey, L. G., cyclical transitions, 3995
Hepburn, H. C., electrolytic water-transport, 2989
Herb, R. G., disintegration of F, 4452; electrostatic generator, 2162
Herbert, J., density of glass, 4768
Herbiet, H., anodic behaviour of Pb, 1301
Hercock, R. J., voltage stabiliser, 2134
Herman, L., equations of state, 778; O_3 bands, 716; valve amplifier, 2132
Herman, R. C., vibration spectra and molecular structure, 4129
Herman-Montagne, O_3 bands, 716
Hermann, H., relativistic dynamics, 1476

Hermans, J. J., colloid particles in ultrasonic field, 1388, 4751 ; electrolytic thermo-cells, 2988 ; kataphoresis, 4750
Herou, R., international ohm, 3355
Herr, D. L., equation solver, 4791
Herre, E., electrolytes, 1686
Herrick, J. F., thermostromuhr, 1746
Herz, R., photometer, 3231
Herzberg, G., stellar atmospheres, 2336
Herzberg, L., HDO spectrum, 208
Herzberger, M., optical paradox, 1167
Herzfeld, K. F., sound reflection, 2965
Herzog, R., mass-spectrographs, 2551, 3350, 5026
Herzog, W., polarising plates, 3234, 4500
Hess, H., boric acid continuum, 4548
Hess, K., viscosity of sols, 1784
Hess, V. F., cosmic rays, 1986, 4080
Hetland, E., refraction of H_2S and D_2S, 2445
Hettner, E., dielectric properties of solid HCl, 835
Hettner, G., dielectric properties of solid HCl, 835 ; rotational transformation, 2211
Hetzler, C., infra-red stellar surveys, 534
Heuer, W. W., high-vacuum still, 5002
Hevesy, G., diffusion in solids, 3495
Hewson, E. W., aurorae, 123 ; air mass analysis, 3610
Heyden, M., cosmic rays, 4910 ; nuclear moment of Al, 2886 ; Sr^{87} and Rb^{87}, 723, 1580
Heydenburg, N. P., nuclear research apparatus, 616 ; production of N^{13}, 1573 ; proton scattering, 1311
Heyer, E., frost frequency, 1551
Heyl, P. R., "The Skeptical Physicist", 1847
Heyn, F. A., radioactivity of Ni, Cu and Zn, 145
Hibbert, H., surface tension of glycols, 1488 ; vapour pressures of glycols, 1690
Hibshman, H. B., melting of mononitrophenols, 248
Hiby, J. W., flow regulator, 1474
Hickling, A., anodic oxidation, 3828 ; electrode polarisation, 329
Hicks, J. F. G., Jr., heat capacity of Tl, 2924
Hidaka, K., ocean waves, 3165 ; oscillations of water in basin, 547
Hiedemann, E., diffraction of light by h.f. sound, 277, 2536
Higgs, P. M., submarine photometer, 1930
Hildebrand, E., dia- and paramagnetism in metal crystals, 882
Hildebrand, J. H., heat data of I_2, 3295 ; solubility of I_2 in CCl_4, 72 ; thermal data for $TeCl_4$, 4979
Hill, A. E., transition temperature of gypsum, 74
Hill, A. G., energy of Na photoelectrons, 1349
Hill, D. G., parachor of NO_3F, 84
Hill, E. L., Dirac electron, 3957
Hill, R. D., production of γ-rays by neutrons, 1583, 2829
Hillebrand, K., cosmic dust-cloud, 1017
Hillson, S. P., vacuum spectrograph, 4975
Hilsch, R., phosphors, 652 ; photochemical processes in crystals, 2249, 3678 ; photo-currents in crystals, 1356 ; secondary photo-current, 381
Hilton, W. F., thermal effects on body in stream, 4578
Hiltscher, R., photoelasticity, 2258
Hinman, W. S., Jr., radio meteorograph, 1936
Hinshelwood, C. N., reaction kinetics, 786
Hippauf, E., currents in dielectrics, 1722
Hipple, J. A., Jr., dissociation of ethane, 2124 ; mass spectrometer, 1769
Hirata, F., thermoeversible gel, 1773
Hirone, T., magnetostriction, 2179 ; Ni alloys, 4690
Hirota, K., H_2 electrode, 2147
Hirschfelder, J., structure of H_3, H_3^+, and of H_3^-, 12
Hirschfelder, J. O., Joule-Thomson coefficients, 2085
Hirschlaff, E., velocity of sound in N_2, 2531
Hislop, G. S., turbulence, 3511
Hixson, A. W., dew point, 2797
Hjerting, F., line absorption coefficients, 4843
Hoar, T. P., tarnishing, 3830
Hoard, J. L., structure of di- and tri-germane, 3441 ; structure of $Na_3C_6N_9 \cdot 3H_2O$, 2679
Hobart, G., brain potentials, 359, 2181
Hoch, J. H., effect of X-rays on cells, 4707
Hochberg, B. M., semiconductors, 3814
Hodge, A. H., specific heats of air, N_2, and CO_2, 281 ; ultrasonic velocity of gases, 280
Hodges, D. B., lightning, 2383
Hodgson, E. A., structure of earth, 4026
Hoecker, F. E., oscillograph, 2626
Hönigschmid, O., atomic weights, 2214
Hoesch, K. H., elastic constants, 3922
Hof, S., u.v. absorption of Au and Ag, 3207
v. Hofe, C., exit pupil of telescopes, 4509
Hoffleit, D., meteor photographs, 1013 ; stellar magnitudes, 1031
Hoffman, J. G., disintegration of B^{10} and Li^6, 1116 ; neutron absorption, 865
Hoffmann, E., graphite suspensions, 2227
Hoffmann, F., melting point of Si, 247
Hoffmann, J., photochemical changes in compounds, 1154
Hoffmann, K., conductivity anomalies, 4288 ; light source, 2216; turbidity of As_2S_3 sols, 3050 ; X-ray scattering, 4970

Hofmeyr, W. L., rainfall, 3618
Hofstadter, R., vibration spectra and molecular structure, 4128, 4129, 4130
Hoge, H. J., neutron scattering, 4226
Hogg, A. H. A., equilibrium of thin plate, 1416; fluid motion along tube, 4783
Hogrebe, K., depolarisation of scattered light, 1622
Hohle, W., a.c. instrument calibration, 2108
Hohls, H. W., surface tension of aqueous alcohol, 992
Hoisington, L. E., Coulomb wave functions, 4802
Hoja, E., photoelectric sensitivity of ZnO, 3877
Holbro, V., u.v. dispersion, 1168
Holleck, L., Li isotopes, 398
Holley, C., Ba-Cu-stearate films, 1866
Hollmann, H. E., dielectric constant of an electron stream, 3797; heart excitation, 3028
Holloway, M. G., range of α-rays, 3201
Holmberg, T., calorimeter, 2925
Holmes, F. T., axial magnetic suspension 358
Holmes, H. N., surface tensiometer, 4370
Holmes, J. G., floodlight beacons, 3747
Holmes, M. C., radio waves, 2190
Holmquest, H. J., radiographic nomogram, 4251
Holuba, M., absorption in radioactive emission, 590
Holway, A. H., discrimination of intensities, 2485
Holzapfel, L., life of gaseous ions, 298
Holzer, R. E., lightning, 1563
Holzmüller, W., synthetic resins, 3504
Honda, K., magnetisation of Fe monocrystals, 4240
Honeyburne, J., Ra depth doses, 5071
Honty, L., spectrophotometer readings, 2879
Hoog, H., freezing points of hydrocarbons, 1241
Hopkins, M. R., heat conduction, 3761
Hopmann, J., stellar magnitudes, 4840
Horiuti, J., H_2 electrode, 2147; rate of chemical reaction, 2089
Horner, R. G., three-colour photography, 666, 3226
van der Horst, C. J. G., structure of ice, 3469
Horton, C. A., Stark effect in A and Kr, 1218
Horton, J. W., cardiotachometer, 4250
Hosokawa, T., wave geometry, 1837, 4810
Hostinský, B., diffusion, 2688; statistical mechanics, 4795
Hottenroth, G., electron mirrors, 868
Hou, C. H., surface conductivity of quartz, 1710
Houghton, J. L., optical bench, 4932
Houpillart, J., Hartley figures, 231
Houston, W. V., surface photo-effect, 377
Houtermans, F. G., neutron absorption, 864
Houtgast, J., Fraunhofer lines, 3601; spectrophotometry, 3245
Hovorka, F., thermodynamic data of hexyl alcohols, 2519
Howard, R. A., atomic vibrations in Zn-Cu, 3058
Howarth, L., boundary layer equations 1430; flow in pipes, 3933; liquid jets, 2267; turbulence, 457
Howe, H. H., magnetometer observations, 3190
Howe, J. D., cyclotron, 1733
Howell, H. G., TlCl spectrum, 2893
Howell, W. T., hermite polynomials, 1831; operational calculus, 57; parabolic cylinder functions, 1453
Hoyle, F., β-transitions, 2835
Hsueh, C. F., Raman spectra of benzene derivatives, 729
Huang Tzu-Ching, ice point and triple point of water, 2075
Hubbard, J. C., specific heats of air, N_2 and CO_2, 281
Huber, P., D-D reaction, 2824
Huck, R. J., oxide-coated kathodes, 2199
Huddle, J. W., sorting of sand by wind, 553
Huddleston, O. L., polyelectrophysiograph, 4702
Hudita, T., Al single crystals, 4308
Hudson, J. C., X-ray dosage, 893
Hudson, R. A., simultaneous adsorption, 1486
Hübner, H. J., spectral line reversal, 4583
Huffman, H. M., heats of combustion, 2942
Hufford, M. E., diffraction patterns, 657
Huggins, M. L., viscosity of solutions, 4830
Hughes, A. L., electron velocities, 1308, 4225; Knudsen gauge, 68
Hughes, D. S., K resonance lines, 692
Hughes, E D., reaction kinetics, 786
Hughes, J. W., uniaural threshold, 5016
Hukuda, T., elasticity of hot wires, 1419
Hulburt, E. O., magnetic data, 581; searchlight beam, 125; twilight, 3178; upper air ionisation, 1564
Hulswit, W. H., Jr., ultrasonic velocities in benzene, 1260
Hultgren, R., Fe-Pd alloys, 4760; X-ray diffraction films, 942
Hulubei, H., element 87, 242; element 93, 4115; white and black lines in X-ray spectra, 1227
Humason, M. L., Novæ, 4405
Hume-Rothery, W., atomic and ionic radii, 3442; compounds of type Mg_2Sn, 931; lattice constant of Ag, 3466
Hummel, J. N., seismic-electric effect, 3180

Humphreys, C. J., Ne, A and Kr spectra, 1182
Humphreys, W. J., volcanic dust, 118
Humphry, R. H., resistance of Sn, 2979
Hund, F., electromagnetic units, 2705; magnetisation of small specimens, 3020; nuclear forces, 389
Hunsmann, W., accommodation coefficients, 4353; adsorbed gases, 3549; vibrations of ethane, 2031
Hunt, F. V., gramophone records, 3338
Hunter, A., astronomical spectroscopy, 1043; photographic sensitivity, 1157
Hunter, H. W., Raman spectrum of dioxane, 4147
Hunter, J. de G., theodolite, 2783
Hunter, R. F., trimethylene biradical, 2213
Hunter, W., rotating thread, 1424
Hurst, C., potential problem, 1316
Hurst, D. G., energy losses of electrons, 338
Husimi, K., phase integrals, 4993; slowing down of neutrons, 5054; statistical mechanics, 978, 3097
Huster, E., solutions of Na in NH_3, 1332
Hutchings, P. H., opposition of Eros, 518
Huxley, L. G. H., electromagnetic waves in ionosphere, 1347
Hyman, H., magnetic rotation, 4905
Hynek, J. A., 5 Lacertæ, 4003

Iandelli, A., rare-earth compounds with Bi, 932; structure of alloys, 1787
Iball, J., structure of anthracene derivatives, 3479; structure of condensed ring compounds, 3062
Ibbs, T. L., thermal diffusion, 42
Ichimiya, T., cosmic rays, 632
Ieviņš, A., crystal structure methods, 3916; lattice constants of Bi, Mg and Sn, 3911; lattice constants of LiCl and NaBr, 2675
Iguchi, S, vibrations of plate, 4319
Iida, K., elastic waves in sand, 2354; elasticity of soils, 4030
Iimori, S., luminescence of calcium silicate, 1604; spectrum of autunite, 2048
Iimori, T., oxide films on Fe, 1489; passivity of iron, 1862
Iitaka, I., fineness of powder, 3942
Ikebe, T., vibration of bar, 3925
Illgen, H., ballistics, 474
Imahori, K., absorption spectra and H-bridges, 2892
Imai, I., flow past cylinder, 4325; fluid motion, 51; sphere in stream, 2699; turbulent flow, 4327
Imanishi, S., structures in molecular spectra, 2033
Immelman, M. N. S., thunderstorms, 1105
Inamura, Y., halochromism, 4532
Infeld, L., field theory, 2726
Ingalls, E. N., dielectric constant of D_2O, 2985
Ingber, O. H., densitometer, 2005
Ingersoll, L. R., polarisation ellipticities, 674
Ingle, J. D., molar weights of vapours, 1802
Inglis, D. R., nuclear moments, 2025, 3246
Ingold, C. K., mesomerism, 1376
Ingram, W. H., Kirchhoff constraints, 4189
Innes, G. S., h.v. X-ray therapy, 3863
Inouye, W., earthquakes, 1100, 2376, 4878
Inui, T., H_2 molecule, 4737
Ionescu, A., oscillating spark discharge, 807
Ionescu, T. V., short-wave oscillator, 4259
Ionov, V. N., identification of Ra, MsThI and RdTh, 592
Irany, E. P., viscosity function, 4374
Isajev, B., cosmic rays, 633, 634
Isemura, T., rhythmic precipitation, 3901, 3902
Ishiguro, K., fracture of glass, 4320
Ising, G., gravity, 951
Iskander, A., triode hysteresis, 4257
Iskenderian, H. P., Rankine balance, 883
Istraty, C., acoustic resonance in liquids, 1693, 1694
van Iterson, G., Jr., polystyrene films, 4747
Itimaru, K., wave geometry, 4809
van Itterbeek, A., adsorption of He, 3111; adsorption of O_2 and CO_2, 486; properties of He, 4585; sound absorption in CO_2, 2105; sound absorption in O_2, 2106; velocity of sound in A and D_2, 5009; velocity of sound in H_2, D_2, He and Ne, 5010; velocity of sound in NO, 3332; velocity of sound in O_2, 3331; viscosity of He, 1878
Ives, H. E.. Doppler effect, 481; emission of alkali-metal films, 5078; moving atomic clock, 3541; optical constants of Rb and Cs, 191; Sagnac phenomenon, 3964
Iwamura, A., spectrum analysis, 2015, 2016
Iwanenko, D., reciprocal action, 3096; theory of showers, 4472
Iwase, E., kathodoluminescence of Ca compounds, 2904; luminescence of Al_2O_3, 3670; luminescence of calcium silicate, 1604; luminescence of scapolite, 653; spectrum of autunite, 2048
Iwasè, K., absorption of H_2 and N_2 in Fe, 4811
Iwatsuki, T., wave geometry, 1838, 4805, 4806

Jaanus, R., magnetic hysteresis, 1324; susceptibility of Ce, 2168
Jabłoński, A., Franck-Condon principle, 2890; line broadening, 3243; polarisation and temperature, 3695

Jackson, D. A., hyperfine structure of Al, 722 ; resonance lines of K, 2024 ; resonance lines of Na, 3708
Jackson, J., satellites of Jupiter, 4837 ; stellar distribution, 3142
Jackson, L. C., susceptibility of $K_3Fe(CN)_6$, 3857
Jackson, R., electron diffraction methods, 4227
Jacob, C., fluid motion, 3076 ; gas jet, 957
Jacob, C. W., structure of U, 422
Jacob, L., electron-optical system, 4680, 4681
Jacobs, M. H., diffusion in living systems, 1803
Jacobs, R. B., forms of P, 9 ; polymorphic transitions, 4298 ; X-ray diffraction under pressure, 4157
Jacobsohn, S., quartz monochromator, 2636
Jacoviev, B. I., explosion of N_2O, 4589
Jacquet, P., electrolytic deposits, 2737
Jacquinot, P., Zeeman effect, 1656, 3733, 3734
Jacyna, W., gas-thermometric data, 251 ; temperature scale below 1°K, 250 ; thermal data for He, 2082 ; thermodynamic scale, 2932
Jaeckel, R., neutron resonance levels for Ir and Rh, 862, 4676
Jaeger, F. M., allotropy of Nd, 1380 ; complex salts of Cr, Co and Rh, 4924
Jaeger, J. C., heat conduction, 4577
Jaeger, R., radiation protection, 4254, 5070
Jänecke, E., binary systems, 3777, 4592
Järnefelt, G., Nova Herculis, 2774
Jagielski, A., dielectric polarisation of chloronitrobenzene, 315
Jahn, F. P., entropy of NOCl, 2950
Jahn, H. A., elastic constants, 47 ; stability of polyatomic molecules, 221
Jahoda, M., piezoelectric crystals, 1758
James, H. M., H_2 spectrum, 2337 ; molecular potential curves, 4961 ; wave functions for excited H_2, 4939
Jander, G., aerosols, 4744
Jánossy, L., cosmic rays, 4085, 4909
Janowsky, B. M., unifilar magnetometer, 3189
Jarnak, P., violin, 1692
Jarratt, J. R., parachors, 3981
Jaspers, A., Curie point of Ni-Cu alloy, 356
Jatkar, S. K. K., refraction of oils and fats, 4506 ; Siemens ozoniser, 4630
Jauch, J. M., Dirac's equations, 3092
Jauncey, G. E. M., X-ray scattering by quartz, 4263
Jeans, J. H., origin of planets, 4382
Jeffreys, H., correction of frequencies, 1455 ; distributions in astronomy, 511 ; earthquakes, 574, 2377 ; gravity anomalies, 451 ; law of error, 3087 ; maximum likelihood, 2278 ; probability, 966, 3955 ; science, logic and philosophy, 2288 ; significance tests, 1832 ; temperature in earth's crust, 550 ; theory of errors, 3954
Jehle, H., stellar theory, 2320
de Jekhowsky, B., minor planets, 3139
Jelnicki, S., Al-Cu alloys, 4581
Jenckel, E., viscosity of Se glass, 4375
Jenkins, F. A., AgCl spectrum, 216 ; C isotopes, 399 ; SnF spectrum, 215
Jenkins, G. I., electric polarisation, 4651
Jenkins, R. O., oxide-coated kathodes, 2199
Jensen, H., crystallographic radii, 4754
Jentschke, W., mass of neutron, 4669 ; scattering of Po α-particles, 1120
Jeppesen, C. R., H_2 bands, 3264
Jesse, W. P., cosmic rays, 2421
Jessup, R. S., combustion of isoprene, 2508 ; heats of combustion, 4988 ; heats of formation, 4989
Jevons, W., u.v. bands of SnO, 4543
Jobbins, H., blueness of sky, 1934
Joglekar, M. S., magnetic anisotropy of Tutton salts, 1736
Johannsen, G., $\alpha \rightleftharpoons \beta$ transformation in Mn, 2670
Johansson, E., stellar parallaxes, 1004
Johansson, O. V., rainfall, 2798
John, W. J., magnetic birefringence, 1587
Johns, H. E., refractive index of He, 4112
Johns, M. W., Hg III spectrum, 1186
Johnson, B. K., spectrograph, 2479
Johnson, C. A., gas-liquid hydrocarbon systems, 5004
Johnson, E. A., magnetic moments, 4698
Johnson, L. B., Hg arcs, 4515
Johnson, M. C., deposition of O_2 upon W, 1364 ; neutrons and white dwarfs, 1908
Johnson, R. P., electron microscopes, 4230 ; engine for smoothing wires, 4268 ; filament surfaces, 4365
Johnson, T. H., cosmic rays, 1985, 1987, 3664, 4473 ; Geiger Müller counters, 3204
Johnston, H. F., magnetic character-figure, 2384
Johnston, J. E., soft X-ray bands from dilute alloys, 749
Joliot, F., helion-deuteron collisions, 2825 ; transmutation of B, 1952
Joly, M., monomolecular films, 496, 996, 4824
Jones, C. C., heavy β-particles, 1962
Jones, E. T., vibratory electron, 2619
Jones, F. L., sparking potential of Hg vapour, 1267

Jones, F. W., Cu_3Au alloy, 2672; particle size, 2491
Jones, G., viscosity of MeOH, 3566
Jones, H., liquid HeII, 2503
Jones, H. Spencer, α Ursae Majoris, 1060, 2344; minor planet Hermes, 3586; nutation constant, 2756; opposition of Eros, 517; stellar photography, 2433; time measurement, 998
Jones, J. T., simultaneous adsorption, 1486
Jones, M. W., latent image, 176
Jones, R., colloidal graphite, 3292
Jones, R. B., galaxies, 3135, 3991
Jones, T. I., r.f. currents, 1279
Jones, W. H., frictional electricity, 1319
Jones, W. J., simultaneous adsorption, 1486
Jones, W. P., differential equations, 2277
de Jong, W. F., reciprocal lattice, 1412, 1413, 1800; structure of aximite, 3472
Jonker, K. H. J., cosmic rays, 1142, 1575, 4476
Joos, G., spectrum of uranyl nitrate, 4934
Jordan, D. O., glass electrode, 5046
Jordan, P., biological processes, 4721; cosmology, 3579; Dirac magnet pole, 2716; radiation effects on genes, 3033
di Jorio, M., absolute zero, 2514
Joshi, R. D., electrical constants of soil, 2791, 2792
Jost, W., explosive processes, 4992; flame velocities, 770; ionic cystals, 3461
Jouaust, R., international ohm, 3355; short-wave fading, 1346
Jouguet, E., frequency formula, 4602
Joy, A. H., W Canum Venaticorum, 4842
Juda, W., overvoltage, 322
Judd, D. B., theatrical lighting, 4565
Jüttner, F., quantum theory, 2711
Jungers, J., Raman spectra of deuteroethylenes, 2911
Junkelmann, R., excitation by canal rays, 689
Juraszyńska, H., MgD$^+$ spectrum, 4136
Justi, E., conductivity of Pb in magnetic fields, 4233; conductivity of W, 305; resistance of Al crystals, 1732

Kahan, T., initial magnetisation, 1331; isomeric nuclei 391; neutron-proton collisions, 2158; nuclear disintegrations, 2819
Kahn, B., condensation, 2512
Kaischew, R., entropy of CO, 3786
Kakinoki, J., fibre structures, 1775
Kakinuma, U., electron spin, 1729; structure of electron, 4668
Kalandyk, S., thermionic emission of Pt, 4730
Kalisch, H., glow-discharge electrolysis, 3823
Kaltenbach, J., monochromatic filters, 1130
Kamieński, B., dielectric potential and surface tension, 88; surface phenomena, 87
Kamieński, M., comet Wolf I, 96
Kamiyama, M., Hg I spectrum, 1638; Si spectrum, 198
Kanai, K., cooling of earth, 4027, 4028, 4854; planets, 2758; Rayleigh waves, 1097, 4048; seismic waves, 4875, 4876; stability of earth, 1098; structural vibration, 2375, 4877; tidal waves, 1077
Kanamaru, K., electrokinetic potential, 3052; hydrophilic properties of cellulose, 3450; lyophilic properties of nitrocellulose, 3449; sorption by cellulose, 3542
Kanda, E., adsorption of He, 1856; entropy of F_2, 1232; liquid O_2, F_2, Cl_2 and HCl, 491; separation of F_2 from O_2, 76; viscosity of F_2, 91
Kandilarow, G. G., activation of C, 3543
Kane, G. P., ignition of hydrocarbons, 3315
Kano, H., oxidation of Al, 2306
Kapitza, P., viscosity of liquid He, 1497; Zeeman effect, 3274
Kaplan, J., aurora, 3672, 4044, 4045
Kappler, E., Brownian motion, 1829; 2273
Kapur, A. K., water vapour in upper air, 3619
Kapur, P. L., nuclear reactions, 2395; potential barriers, 470; transmutation function, 144
Kar, K. C., elastic scattering by H and He, 341; scattering of particles by atoms, 340
Kara-Michailova, E., Ac γ-rays, 3650
Karantassis, T., atomic moment of Re^{IV}, 3402
Kargin, V., heat of sorption on nitrocellulose, 490; highly-polymerised solutions, 3108
Karim, S. M., CCl_4 spectrum, 1204; $SiBr_4$ spectrum, 698
Karim, M., $SiCl_2$ and $SnCl_2$ bands, 2897
Karlick, B., fluorescence of rare earths, 645
Karlsons, K., lattice constants of Bi, Mg and Sn, 3911; lattice constants of LiCl and NaBr, 2675
v. Kármán, T., supersonic flow in gases, 1824
de Kármán, T., turbulence, 457
Karrer, S., Cu arc, 808
Karweil, J., vibrations of ethane, 2031, 4126
Kasiwagi, Y., glow discharge, 2967, 4624
Kasper, H., theodolites, 4851
Kast, W., anisotropic liquids, 428; liquid crystals, 4305

Kaster, K. P., opposition of Eros, 518
Kastler, A., isotope separation, 3885
Katchenkov, S. M., spectra of Pr and Nd salts in D_2O, 3716
Kato, M., photon counters, 4923
Kato, S., absorption spectra and molecular structure, 4531
Katô, Y., earth's magnetism and earthquakes, 4443 ; magnetism of rocks, 4426
Katsurai, T., Fe_3O_4 hydrosol, 1382 ; ferromagnetic gels, 4285
Katz, H., passage of electrons through metal foil, 5051, 5052 ; slow electrons 856
Katz, J. R., viscosity of starch paste, 4832
Katz, L., Joule and Joule-Thomson effects, 2084
Katz, M. L., luminescence of rock-salt, 1150
Kauko, Y., glass electrode, 2148
Kawabata, Y., atmospheric O_3, 555
Kawada, T., hyperfine structure of Os, 4938 ; isotope displacement in W lines, 1188
Kaye, G. W. C., γ-ray measurement, 4256 ; X-ray protection, 4713
Keck, P. H., photographic graininess, 3221
Keegan, H. J., spectrophotometer, 4966
Keenan, P. C., solar granules, 4412 ; solar limb darkening, 539
Keesom, A. P., heat conduction in liquid He II, 2070
Keesom, W. H., atomic heats of tin, 1671; heat conduction in liquid He II, 2070; liquid He temperatures, 252 ; low-temperature thermometers, 3308 ; resistance thermometers, 2936 ; structure of liquid He, 1791 ; structure of solid He, 1403 ; thermo-e.m.f. of supraconductors, 1366, 3040; thermo-molecular pressure, 1438 ; viscosity of He, 1878, 3568 ; viscosity of H_2, 3569, 3571
Keevil, N. B., geologic age, 4446
Keffler, L., heat produced in lead by own weight, 2498
Kellermann, E. W., luminescence of fluorite, 164
Kelley, J. D., light pulses, 1165
Kelley, K. K., thermodynamic properties 1687, 1688
Kelley, W. M., atomic weight of Pb, 909
Kellner, L., infra-red spectra of organic molecules, 1196
Kemble, E. C., reality and quantum mechanics, 1846
Kemmer, N., nuclear forces, 2206, 3436 ; nuclear interaction, 1760
Kemp, A. R., sorption of water by rubber, 2300
Kemp, E. H., brightness discrimination, 3749
Kemp, J. D., thermal data of N_2O_4 and NO_2, 1249 ; thermal data of propane, 3782 ; thermodynamics of CH_3Br, 4596
Kemper, W. A., melting of compounds adsorbed on silica gel, 2073, 2074
Kennard, E. H., dimensions, 3088
Kennedy, S. J., liquid crystals, 3117
Kennedy, W. P., sky radiation, 3608
Kennelly, A. E., M.K.S. units in electro-acoustics, 2539
Kent, N. A., Littrow spectrograph, 3280
Kent, R. H., flight of projectile, 3524 ; motion of powder gas, 4991
Kępin̂ski, F., Comet Kopff(1906e), 4834
Kerkof, F., thermoelements, 2203
Kerkum, J., Geiger counter, 3348
Kern, J., Hg arc, 4514
Kerst, D. W., thyratron counter, 2404
Ketelaar, J. A. A., complexity of P_2O_5, 4281 ; electrolytic conduction in solids, 3810 ; structure of NOCl and NOBr, 402
Keyes, D. B., fractionating columns, 4599
Keyes, F. G., equation of state, 4172
Khaikina, S. E., oxidation of C, 2509
Khan, M. A: R., meteoric phenomena, 3575
Khanna, M. L., paramagnetism of Fe group, 1738
Kharadse, E. K., P Cygni, 4394
Kharamonenko, S. S., periodic reaction of $Ag_2Cr_2O_7$, 1393
Khastgir, S. R., attenuation of radio waves, 4724 ; dielectric constants of ionised gases, 2984 ; electrical constants of soil, 2355 ; SiC rectifier, 3806
Khol, F., elastic constants, 1418
Khurgin, J., cyclotron, 3655
Khvostikov, I. A., diffuse light from sky, 568 ; fluorescence depolarisation, 163
Kieffer, J., laminagraph, 2635
Kienle, H., stellar photometry, 4833 ; stellar spectra, 4396
Kiepenheuer, K. O., photon counter, 183 ; solar prominences, 1067 ; solar radiation, 1078
Kieselbach, L., Hg kathodes, 4222
Kiess, C. C., Fe, Ti and C spectra, 686 ; Si spectrum, 3705
Kiessig, H., K-lines of B, 240 ; M-series of Cd (48) to Ce (58), 4159 ; viscosity of sols, 1784
Kikoin, I. K., gyromagnetic effect, 3860
Kikuchi, S., D-D neutrons, 4675
Killingsworth, R. B., vibration spectra and electric moments, 708
Kimball, G. E., heterogeneous reactions, 3787
Kimball, W. S., line integrals, 463
Kimura, H., latitude, 2322
Kimura, K., X-ray analysis of La, Nd and Gd, 2064

Kincaid, J. F., chemiluminescence, 3322; liquid molecules, 4330; refractive index of benzene, 1811
Kinder, W., vapour-air mixtures, 1607
Kindinger, M., optical constants of metal foils, 4503
King, A., activated C, 3452; chemisorption, 2732; dual emulsions, 2229 metal trees in gels, 2995; thoriated W surfaces, 2198
King, A. S., solar spectrum, 537, 1538
King, G. W., structure of hydrides, 3048
King, L. D. P., disintegration of Li, 3198, 3199; nuclear research apparatus, 616
King, R., e.h.f. capacitance, 1298
King, R. B., solar reversing layer, 538; solar spectrum, 537
Kingdon, K. H., biological effects of X-rays, 4706; X-ray tube, 894
Kingerley, R. W., La amalgam electrode, 2584
Kingslake, R., highway reflectors, 4495
Kinsey, E. L., rotation of H_2O molecules, 4943
Kip, A. F., cloud chamber condensation, 2951; marine sediments, 4852; point-plane discharge, 4191; Ra in sea water, 4422
Kirby, S. S., magnetic data, 581
Kirchner, F., electron diffraction by crystals, 418; electron diffraction by thin foil, 858; ionising power of atomic nuclei, 596; ionising power of Li-particles, 138; twinning in metals, 4297
Kirensky, L. V., magnetic energy in Ni crystals, 1325
Kirkham, D., susceptibility in Ni, 352
Kirkpatrick, P., polarised X-rays, 671
Kirkwood, J. G., dissociation constants, 4217; order and disorder in alloys, 928
Kirsch, W., crystallisation of rubber, 3454
Kissin, G. H., Raman spectra of CH_3OH, 229
Kistiakowsky, G. B., heat capacity of C_2H_6, 754
Kitagawa, K., flow of underground water, 3935; turbulence, 4323
Kitaigorodsky, I. I., strength of glass, 4321
Kitchener, J. A., photosensitisation, 1999, 3684
Kiuti, M., isotope displacement in W lines, 1188
Kiveliovitch, M., equations of hydrodynamics, 2264
Klarfeld, B., positive column, 4196
Klarmann, H., conductivity of films, 4642
Klee, T., brightness of sky, 4866
Klein, E., sound intensity in liquids, 2107, 4617
Klein, O., electron emission, 4265; electrons in crystal lattice, 2126; Volta potentials, 3829
Klein, O. C., X-rays from radio valves, 745
Klein, W., ions in air, 579
Kleinheksel, S., overvoltage, 2145
Klemenc, A., glow-discharge electrolysis, 3823, 3824
Kling, R., liquid jets, 2272
Kljatschko, J. A., gases in metals, 986
v. Klüber, H., deflection of light, 69
Kluge, W., metal surfaces, 3979
Knappsberg, L., glass electrode, 2148
Knauer, F., radio-As., 3194; thermal neutrons, 1314
Knauss, H. P., temperature from band spectra, 218
Kneen, E., contact angles, 494
Knerr, H. W., h.f. spectrum of water, 368
Kneser, H. O., refractive indices of liquids, 3701; sound absorption in liquids, 3340
Knipp, J. K., interatomic forces, 2287; K-electron capture in Be^7, 4890
Knöll, H., Liesegang rings, 922
Knol, K. S., a.c. measurements, 2129
Knoll, M., electron lens, 4682
Knorr, H. V., spectroradiometer, 2008
Knox-Shaw, H., spiral nebulæ, 3136
Knudsen, V. O., sound absorption in CO_2, 4616
Koana, Z., solar spectrum, 1534
Kobayakawa, K., CdI spectrum, 4936
Kobayasi, M., electron pair creation, 2154; spectra of coordination compounds, 4132
Kobeko, P., elastic deformation, 46
Kobosev, N. I., adsorption theory, 75
Koch, B., quartz-Hg lamps, 4937
Koch, E., ionic conduction in solid salts, 1285
Koch, J., neutrons, 2595
Koch, W., heat conduction of porcelain, 2929
Kochendörfer, A., crystal plasticity, 1420, 2695
Kock, W. E., unified field theories, 2725
Koczkás, J., osmosis, 3497
Koefoed, O., reflecting power of alloys, 1628
Köhler, R., seismograms of explosions, 4874
Koene, C. P., Rn content of tap-water, 1948
König, H., diamagnetic polarisabilities of benzene, 2174; differential amplifier, 5067; heterochromatic photometry, 3692; Hg discharge, 2417; magnetic birefringence, 1588; oscillations in regulators, 449
Koenigsberger, J. G., electrical prospecting, 1073; magnetisation of rocks, 3168, 4424, 4425
Kohasi, Y., standing wave in water, 3795
Kohler, M., resistance in magnetic fields, 1322; resistance of pure metals, 2617; Wiedemann-Franz law, 1287

Kohlhaas, R., structure of cetyl palmitate, 1405; structure of paraffins, 4762
Kolb, J., Brownian motion, 1828
Kolhörster, W., cosmic rays, 1984
Kollath, R., secondary emission of Be, 5056
Koller, K., optical constants of metal foils, 4503
Kolomiez, B., barrier plane photo-cell 4262
Kolthoff, I. M., solubility of AgIO$_3$, 985
Kondô, M., solar spectrum, 1534
Kondorsky, E., magnetic anisotropy, 3845, 4239
Kondratjew, V., CO flame, 2945; OH absorption bands, 211; recombination of OH radicals, 2554
Kondratjewa, H., CO flame, 2945
Konopinski, E. J., excitation functions, 3634
Kontorowa, T., plastic deformation, 1812
Koops, R., canal-ray ionisation, 4626
Kopal, Z., binary stars, 2754, 3578; rotating-gas configurations, 2340, 3154; stellar interiors, 3998
Kopfermann, H., Sr^{87} and Rb^{87}, 723, 1580
Korff, S. A., cosmic rays, 640, 642, 4478
Kornfeld, G., infra-red sensitisation, 2002 photochemistry, 4485
Kornfeld, M., recrystallisation, 34, 1795
Korsching, H., quadrupole moments of Kr and Xe, 3248
Kortschagin, L. W., Raman spectra of PCl$_3$ and BiCl$_3$, 1220
Kortüm, G., structure of electrolytic solutions, 4140
Korvin-Kroukovsky, B. V., efflux of gases, 460
Kosambi, D. D., cosmogonic space, 2319
Koschmieder, H., visibility, 4042
Kossiakoff, A., ionisation constants, 4660
Kotecki, A., light emission by slow particles, 2482
Koteswaram, P., association of acetic acid, 3894; constitution of D$_2$O, 2654; Raman spectrum of water, 730
Kothari, D. S., stellar constitution, 1910, 1911, 3593
Kovács, I., perturbations in band spectra 3266, 3267
Kovarik, A. F., disintegration of Th, 4447
Kovarskaia, B., rubber sols, 2215
Kowarski, L., Geiger counter, 4064
Kozodaev, M., Geiger-Müller counter, 4461
Kraemer, E. O., gelatin, 2222; ultracentrifuge, 1785*
Kraft, H., diffusion in crystals, 4771
Krall, G., hydraulic waves, 3509; wing problem, 3506
Kramers, H. A., hole theory of electron, 971; statistical mechanics, 1471
Krammer, K., reflection of α-particles, 146
Krastanow, L., alkali halide crystals, 3485
Kratky, O., structure of cellulose, 2225
Kraus, C. A., non-aqueous electrolytes, 3105
Krause, F., electron microscope, 869, 870
Krauss, W., vapour pressure of Zn in brass, 795
Krautkrämer, J., structure of metal films, 3468
Krczil, F., retention of vapours by gels, 3968
Krebs, K., absorption bands of hydrogels, 706; positive column, 4195
Kreisler, J., D-D reaction, 2823
Krejci, L. E., gelatin, 2222
Krenzien, O., secondary electrons from adsorbed layers, 859
Krestinskaja, V. N., colloidal silicic acid, 919
Kretschmer, S., wave phenomena in models, 2532
Kretschmer, S. I., reflection of h.f. sound, 4609
Kreutzer, C., liquid crystals, 4306
van Kreveld, A., dark-room illumination, 2430
Krichevsky, I. R., fugacities, 779
Krieger, C. J., Hγ and Hδ in δ Cephei, 532
Krieger, F. J., dielectric properties of acetylenic compounds, 4649
Krishnan, K. S., magne-crystallic action, 2176; magnetic anisotropy of CuSO$_4\cdot$5H$_2$O, 4311; susceptibility of MnCO$_3$, 4245
Krishnan, R., Siemens ozoniser, 4630
Krishnan, R. S., colloid optics, 1623, 2009; light-scattering in colloids, 2010, 3444, 3445
Kritschewsky, I. R., gas solutions, 3102; partial molar volumes of electrolytes, 1853
Kröger, F. A., transformation of ND$_4$Br, 4309
Kroll, W., heat conduction, 1673
Kron, G., field theory, 1851
Kronig, R. de L., paramagnetic crystals, 1292, 3396
Krook, M., stellar atmospheres, 1523; transfer equation for line frequency, 2766
Kroon, R. P., spiral springs, 1417
Krüger, F., internal friction of wood, 3984; solutions of Na in liquid NH$_3$, 4284
Krug, W., circular scales, 4333, 4786
Krujilin, G., heat interchange of condensation, 2522
Kruppke, E., action of kathode rays on Se cells, 379; kathode-ray scattering, 857

Kruse, M., negative dispersion in He, 3238
Kruyt, H. R., dielectric constants of colloids, 317, 833; electrophoresis, 2661
Ksenofontov, A., Hg electrode, 5047
Kubo, K., resonator in sound field, 3337
Kubo, M., dielectric constant of gas, 2140; resonance and internal rotation, 2049
Kubokawa, M., adsorption of CH_4 on Ni, 2295
Kuck, J. A., duroquinone system, 3852
Kudrjawzewa, W., adsorbed acetone, 1997
Küchler, L., intramolecular vibrations in gases, 5013
Kühn, R., works balance, 963
Kuenen, P. H., sedimentation in sea, 115; submarine canyons, 2787
Kuhn, H., hyperfine structure of Al, 722; resonance lines of K, 2024; resonance lines of Na, 3708
Kuhn, W., optically active substances, 2877
Kuiper, G. P., ε-Aurigae, 535
Kujumzelis, T. G., Raman spectra of ions, 4557; vibrations of XO_3-type ions, 4150
Kukkamäki, T. J., sound velocity in air, 2099
Kukles, I., centres and foci, 3953
Kumar, R., vibrating string, 4605
Kuper, J. B. H., electron scattering, 3385
Kurie, F. N. D., cyclotron, 4902
Kurrelmeyer, B., shot effect, 382
Kurtz, R., undertones, 2528
Kurtz, S. S., Jr., properties of hydrocarbons, 4931; refractivity intercept, 193, 679
Kurz, G., excited Tl vapour, 2450
Kurzke, H., contact potential, 3392
Kusaka, S., magnetic dipole, 3393
Kussakow, M., viscosity of associated liquids, 93
Kussmann, A., Curie temperature, 4242; magnetisation of Fe, 351; Mn ferrites, 2620; Ni-Pt Alloys, 3018
Kuvshinskij, E., elastic deformation, 46
Kuzmany, P., activity coefficients, 853
Kwal, B., electromagnetic potentials, 1741; quaternion theory, 1840; Stefan's law, 3210
Kwieser, M., γ-ray ionisation, 3651
Kynch, G. J., electronic structure of molecules, 905
Kyropoulos, S., oiliness, 1871

Laaff, O., Be isotopes, 4450; ionising power of atomic nuclei, 596; ionising power of Li-particles, 138
Laboccetta, L., radius of universe, 4380, 4381
Lacey, W. N., heat capacities of hydrocarbons, 243; viscosity of propane, 3567
Lacoss, D. A. vapour pressure of benzene, 791
Lacoste-Tayan, H., air permeance of magnets, 1330
Lacount, R. G., Littrow spectrograph, 3280
Lacroute, P., P Cygni, 2345
van Laer, P. H., atomic heats of tin, 1671; resistance thermometers, 2936
Lageman, R. T., optical activity of $NiSO_4$, α-$6H_2O$, 4074
v. Lagorio, A., studio photography, 1617
Lagrange, R., elements in sea water, 1540
Lagsdin, J. B., ultracentrifuge, 25
Laidler, T. J., supersonic absorption in smokes, 1259
Laird, E. R., Raman spectra of nitrate solutions, 4559
Lamb, A. B., adsorption by graphite, 3110
Lamb, H. H., smoke and weather, 4859
Lamb, W. E., Jr., nuclear systems, 1761
Lambert, P., ethylene-linkages, 2462; spectra of hydrocarbons, 2453
La Mer, V. K., conductance of salts in H_2O+D_2O, 310
Lamla, E., Kikuchi envelope, 2599, 3003
Lamm, O., diffusion of non-electrolytes, 4314; diffusion of water in glycerin, 4315
Lampariello, G., Jacobi's theorem, 2279
Lampe, I., relative action of neutrons and X-rays, 2634
Lampland, C. O., atmospheric absorption band, 1554; infra-red telluric spectrum, 4013
Lamson, H. W., a.c. bridge detector, 4621
Landau, L., crystals with variable structure, 925; electronic showers, 2424; stellar energy, 1520
Landauer, R. S., X-ray dosage, 3029
Landé, A., quantum theory, 3530
Landon, D. H., secondary emission, 3839
Landsberg, G. S., CH_3OH spectrum, 209; H_2O spectrum, 3715
Landsberg, H., atmospheric nuclei, 4860; blueness of sky, 1934
Landshoff, R., Dirac electron, 3957; X-ray absorption spectra, 2918
Lane, H. H., chromosphere, 1069
Lange, E., electron emission, 4265; heats of dilution, 4169; ideal cell, 320; solutions of noble gases, 2728; thermal properties of D_2O, 775; Volta potentials, 3829
Lange, H., spectra of Pr^{+++} and Eu^{+++}, 2470, 4142
Lange, J., electrolytes, 1686
de Lange, J. J., reciprocal lattice, 1413
Langer, L. M., isomers of In^{116}, 1764
Langevin, A., large and small ions, 823

Langmuir, I., crystal analysis, 4757; monolayers, 86, 2739; structure of insulin, 4301; surface electrification, 2740; surface motion of water, 1541
Langseth, A., Raman lines in benzene, 2910
Langstroth, G. O., light sources, 1639; spectrum analysis, 2017, 2447
Langweiler, H., detonation, 4591
Lankelma, H. P., thermodynamic data of hexyl alcohols, 2519
Laporte, M., white light, 3731
de Lapparent, J., clays, 37
Larionov, J., spectra of Pr salts, 4539
Larmor, J., zodiacal light, 1072
Larsen, E. C., colloidal electrolytes, 4641
Larson, W. D., Ag electrode, 327
Larsson, E., Se photo-cells, 1355, 2194
Lasarew, B. G., Hall effect, 2614
Laslett, L. J., energy losses of electrons, 338
Lassettre, E. N., Raman spectrum of BF$_3$, 3738
Latimer, W. M., entropies of ions, 4175
Latyschev, G., Geiger-Müller counter, 4461
Laubengayer, A. W., structure of di- and tri-germane, 3441
v. Laue, M., condensed phases, 5000; diffraction theory, 4484; electron diffraction by crystals, 418; Kossel effect, 2488; luminosity of nebulæ, 1892; supraconductivity, 1713, 2981, 2982
Laufer, M. K., rotating beacons, 3746
Lauffer, M. A., electric moments, 3123
Laun, D. D., W spectra, 3706
Laurence, G. C., γ-ray measurement, 3865
Laurent, H., radioactive Ag, 2387, 3635
Laurent, P., magnetic properties of NiCl$_2$, 4695; subpermanent deformations, 3924
Lauritsen, C. C., electrometer, 151; γ-radiation from B, 1957; γ-ray measurement, 3864; h.v. X-ray tubes, 4715; short ion-path h.v. tube, 1275
Lauritsen, T., electrometer, 151
Laurman, E., Zeeman effect, 3274
Laval, J., X-ray diffraction, 3459
Laves, F., Al-Mg system, 3909; Laue diagrams, 29
Lawrence, A. S. C., viscosity of liquids, 90
Laws, B. C., deflection of plates, 445
Lawson, J. L., scale-of-two circuit, 1707
Lea, D. E., action of radiations on biological materials, 3869, 3870
LeBeau, P., atomic weights, 2214
Leckie, A. H., frequency of N-S link, 3278
Lecoin, M., β-spectra, 2397
Lecomte, J., ethylene-linkages, 2462; infra-red absorption of benzene derivatives, 2034; spectra of heterocyclic compounds, 4524; symmetry of benzene, 3252; spectra of hydrocarbons, 2453; vibrations of benzene derivatives, 1190
Lecornu, L., balloon envelope, 3099; subdivision of solid, 1804
Lee, A. W., seismic waves, 4436
Lee, H. W., optical paradox, 3236
Legrand, J., mean sea-level, 4419
Lehrer, E., effusion-meter jet, 959; infra-red spectrograph, 733
Leighton, P. A., photochemistry, 4485
Leimberger, E., ionic rays, 1706
Leipunsky, A. I., neutron absorption, 864, 1312
Leiss, C., monochromator, 1222
Leitner, Z. A., Grenz-ray therapy, 4709
Lejay, P., atmospheric haze, 4432; pendulum levelling, 1500
Lelchuk, V., flow of gas in pipe, 458
Lemaître, G., Dirac equation, 974
Lemarchands, M., overvoltage, 322
Lemon, H. B., Epsilon Aurigæ, 3160
Lemonde, H, viscosity in binary mixtures, 2251
v. Lengyel, B., e.m.f.s. between glass and salts, 324
Lennard-Jones, J. E., critical phenomena in gases, 1683; equation of state, 776
Lennahan, C. M., aerological observations, 4873
Leo, W., fine structure of He, 696
Leontjewa, A., softening of glass, 1173
Lepeschkin, W. W., liquid-liquid mixtures, 4999
Lepin, L., passivity of metals, 3118
Lerman, F., thermodynamic functions, 262
Leslie, R. T., high-vacuum still, 5002
Lessheim, H., polyatomic molecules, 1765
Lettau, H., pendulum oscillations, 545
Levene, P. A., rotatory dispersion, 187, 188
Levi, F., transmission of h.f. sound, 4187
Levšin, V. L., acoustic luminescence, 167
Lévy, H. A., structure of B compounds, 7
Lewina, S., H$_2$ overvoltage, 850
Lewis, A. B., inductor, 357
Lewis, D. T., Macleod equation, 1492; parachors, 3553; viscosity and molecular volume, 3564
Lewis, J. R., adsorption of H$_2$ by Cu, 2297
Lewis, W. C. M., electrophoresis, 3453
Lewkowicz, Z., fluorescence of C$_{24}$H$_{16}$, 159
Li, N. M., dielectric constant and particle size, 832
Liau Ssu-Piu, colour indices of O and B stars, 101

Lichtenstein, R., electron collisions, 4670
Liebmann, H., colloidal graphite, 3292
Liechti, A., polymerisation of oil in condensers, 5040
van Liempt, J. A. M., dark-room illumination, 2430
Lieneweg, F., pH measurement, 848
Liepmann, H. W., velocity of h.f. sound in O_2, 4185
Liesegang, R. E., aerosols, 2664
Lieser, T., solution states of celluloses, 19
Lietz, J., zircon, 36
Lifschitz, I. M., crystals of variable structure, 2057
Lifschutz, H., Geiger-Müller counters, 614, 4897 ; scale-of-two circuit, 1707
Lifshitz, E., deuterons, 2822
Lilly, W. E., elasticity, 1805
Limmer, G., spectral analysis of Fe alloys, 1179
Lind, S. C., colour excited by Ra in glasses, 1993 ; discharge in hydrocarbons, 2553 ; neutrons from light elements, 3196
Lindblad, B., spiral structure in nebulæ, 1891 ; stellar systems, 3153
Lindblad, T., probability, 464
Lindenhovius, H. J., discharges in Ne, 812
Lindholm, E., HCN bands, 2038, 2899
Lindmaier, F., colorimetry, 620
Lindman, K. F., electric wave propagation, 3418, 5074
Lindroth, S., Se photo-cells, 1355, 2194
Lindsay, E. M., galactic structure, 1048 ; stellar distribution, 1026
Lindsay, R. B., acoustic filters, 3327, 5005 ; sound velocity in Bi, 2100
Lingane, J. J., Ag electrode, 327 ; solubility of $AgIO_3$, 985
Linhart, H., dielectric constants of electrolytes, 314
Link, F., twilight, 2369
Linke, F. W., centrifuge, 3456
Linnett, J. W., infra-red and Raman spectra, 4944, 4945, 4946
Linstead, R. P., phthalocyanine spectra, 4133 ; vapour densities, 2686
Lipin, S. W., calorimeters, 2926
Lipson, H., crystal structure factors, 926 ; Cu-Ni-Al alloys, 3910
Lister, M. W., structure of hexacarbonyls, 4740 ; structures of $MoCl_5$ and WCl_6, 4741
Little, W. F., theatrical lighting, 4565
Littleton, M. J., conduction in polar crystals, 1708
Liu Ta-Kong, u.v. bands of C_2H_2, 2452
Livingood, J. J., Fe isotopes, 3195 ; radioactive Mn, 4451 ; radioactivity test for impurities, 4059
Livingston, M. S., disintegration of B^{10} and Li^6, 1116 ; neutron absorption, 865 ; range of α-rays, 3201
Lloyd, D., evaporation, 3617
Lloyd, L. E., activated Cl, 4358
Lloyd, P. E., K resonance lines, 692
Lobel, L., colour photography, 177
Locher, G. L., cosmic rays, 154
Lochte-Holtgreven, W., predissociation, of S_2, 2898 ; Stark effect, 3275
Loeb, L. B., cloud chamber condensation, 2951
Loebe, W. W., works balance, 963
Loebell, M. A., X-ray therapy, 1747
Löbering, J., biophysical X-ray effect, 4708
Lörinczi, K., inert gas terms, 3250
Löschner, F., telescopic graphometer, 1633
Loevinger, R., Epsilon Aurigæ, 2343 ; photographic plates, 2000
Löw-Beer, P., Schiller layers, 1304
Löwy, H., dielectric constants of rocks, 1928 ; electrodynamic volume of particles, 5044
Lohrmann, O., pyrophoric Fe, 2940
Lompe, A., clean-up of inert gases, 2555 ; hollow kathodes, 3346 ; positive column, 1269
London, F., supraconductivity, 302, 2138
Long, F. A., surface tension of soap solutions, 79
Long, N. O., susceptibilities of complex compounds, 3853
Lonsdale, K., magnetic anisotropy of crystals, 1334, 2173
Loomis, A., stroboscope, 5017
Loomis, A. L., brain potentials, 359, 2181
Lord, R. C., Jr., Raman lines in benzene, 2910
Lorenz, F., surface moments, 4796
Loschkarev, M., overvoltage, 2146
Lottermoser, A., photographic emulsions, 2001, 2431
Loughridge, D. H., X-ray scattering in N_2, 4971
Lous, K., longitude, 1505
Love, W. H., biological effects of Ra and Rn, 895 ; critical radiation intensity, 4714
Lovelace, F. E., optical rotation of gelatin, 186
Lovell, A. C. B., metallic films, 2565
Lovera, G., electrification of droplets, 1317 ; γ-ray counter, 4063
Lowan, A. N., wave motion, 3948
Lowry, T. M., dispersion, 189, 197 ; $N_2O_5+O_3$ flame, 2946
Lubański, J., Minkowski world, 2723
Lubiger, F., Thyssen gravimeter, 3073
de Luca, H. A., dielectric constant of cellulose, 4655
Lucas, R., birefringence of liquids due to h.f. sound, 2102 ; thermal agitation of liquids, 762 ; waves in viscous fluids, 2090
Luchsinger, W., disperse gases, 26

Luckiesh, M., W, Hg and Na illuminants, 4102
Ludy, A. K., magnetic data, 581
Lübcke, E., noise, 1262
Lüdemann, K., theodolites, 4018
Luedtke, K. D., Hg-oil systems, 2303
Lueneburg, R., neutron scattering, 866
Lüppo-Cramer, adsorption in photography, 2432, 3222; AgBr emulsions, 4491; desensitation, 173; latent image, 3223; photographic sensitivity, 3686; silver halide layers, 663, 664
Lukens, C., optical properties of metals, 4111
Lukjanov, S. J., secondary electron emission, 2604
Lundberg, W. O., hydrogen liquefier, 272
Lunde, L., susceptibility of Sm^{+++}, 4248
Luneau, J., air resistance, 3507
de Lury, R. E., sunspot influences, 2778
v. Luschinsky, W., combustion of styrols, 4586
Lutz, C. W., space charge in air, 1944
Luyten, W. J., binary stars, 2755; stellar magnitudes, 3587; stellar parallaxes, 2330; stream motions of stars, 1035; system of Algol, 1917
Lyman, E. R., rotational energy of OH molecules, 1653
Lynch, J., earth's core, 3167
Lyons, W. J., plasticity of Pb, Cu and Al, 4318
Lyot, B., solar corona, 1925; transit of Mercury, 100
Lyshede, J. M., tube counter impulses, 2839
Lythgoe, R. J., binocular summation, 2054; visual purple, 744, 2487
Lyttleton, R. A., binary stars, 3577; planets, 3138; satellites, 3576

van Maanen, A., stellar parallaxes, 2331; stellar proper motions, 3147
Maass, O., adsorption of alkalis, 3550; dielectric constant of cellulose, 4655; heat capacity of C_2H_4, 4162; heats of wetting of cellulose, 489; liquid state, 4996
MacAdam, D. L., complementary colours, 2410; luminosity computations, 3233
McBain, J. W., emulsification, 23; sedimentation, 916
Macbeth, A. K., spectra of carbonyl compounds, 4535
MacCarthy, G. R., sorting of sand by wind, 553
McCarthy, J. T., α-particle collisions with nuclei, 608
McCay, M. S., temperature from band spectra, 218
McComb, H. E., earthquake accelerometers, 1560; pendulum control, 1495
Maccormac, M., spontaneous ignition fuels, 1680
McCormick, W. W., Sn II spectrum, 3242
McCulloch, L., crystalline boric oxide, 430
McCuskey, S. W., galactic structure, 4398; radial velocities, 1034
MacDougall, D. P., mechanical analyser, 58; temperature scale below 1°K., 2078
McDougall, J., Fermi-Dirac functions, 980
McDowell, C. S., 200-inch telescope, 507
McEwen, G. F., oceanography, 3603
M'Ewen, M. B., He_2 formation, 2656; Hg_2 formation, 910
McFarlan, R. L., physics in pharmacy, 4563
MacGillavry, C. H., aliphatic C bond, 1404
McGraw, D. A., velocity of sound, 2956
Machatschki, F., crystal chemistry, 1399
MacHattie, L. E., heat capacity of Bi, 4978
Mache, H., atmospheric ionisation, 2809; vaporisation of water, 4176
MacInnes, D. A., conductance of electrolytes, 3811; pH scale, 2993
McIntosh, R. A., real paths of fireballs, 1015
McIntosh, R. L., liquid state, 4996
McKay, H. A. C., diffusion of Au, 3496
McKeehan, L. W., ferromagnetic crystals 1742, 1743
McKellar, A. Nova Lacertae, 1914
McKibben, J. L., electrostatic generator, 2162
McKinley, D. W. R., modulation of light, 2841
McLachlan, N. W., Bessel functions, 3950; Fourier expansion, 56; operational calculus, 4335
MacLauchlan, D. W., conductivity of H_2O_2 and HNO_3, 4640
McLaughlin, D. B., 59d Serpentis, 4404; γ Persei, 4393
MacLean, A. B., exposure calculator, 360
MacLeod, D. B., molecular vibration in liquids, 3939
McMath, R. R., solar prominences, 4411
MacMillan, D. P., structure of liquids, 2246
McNeill, C., X-ray kymograph, 3409
McNeill, D. B., active N, 1605; nitrogen afterglows, 4483
McNish, A. G., earth's interior, 549; electric currents near auroral zone, 2813; ionosphere, 371; magnetic character-figure, 2384; magnetic data, 581
Macpherson, H. T., structure of carbohydrates, 827
McRae, D. R., light sources, 1639; spectrum analysis, 2017, 2447
McTaggart, H. A., light reflected from films, 1621

MacTaggart-Cowan, P. D., aviation and meteorology, 3173
McVittie, G. C., distribution of nebulae, 510; 3582; extra-galactic nebulae, 2325, 3994; nebular counts, 98
Macwood, G. E., viscosity and slip of fluids, 2316, 3570; viscosity of He, 3568; viscosity of H_2, 3569, 3571
Madia, G., electron microscopes, 342
Madsen, C. B., counter circuit, 4898
Madsen, J. C., tube counter impulses, 2839
Maeda, K., lyophilic properties of nitrocellulose, 3449
van de Maele, radio-kinematography, 3408
Maercks, O., fluorometer, 4094; supersonic optical shutter, 4182
Magat, M., molecules in condensed phases, 4278; vibration spectra of condensed molecules, 4141
Magnan, C., nuclear reactions, 598
Magnaradze, L., theory of elasticity, 4316
Mahanti, P. C., SnO spectrum, 3257
Mahl, H., electron-optical kathode imagery, 2161; field emission of layered kathodes, 1363; ionic emission from wires, 3880
Maier, W., anisotropic liquids, 428; examination of jewels, 4927; liquid crystals, 4307
Maier-Leibnitz, H., cosmic rays, 593; disintegration of B, 142; transmutation of B^{10} into C^{13}, 143
Maione, A., infra-red absorption of $CHCl_3$ and $CHBr_3$, 701
Majumdar, B., absorption in ionised gas, 4463
Majumdar, R. C., ionosphere, 896, 2811
Majumdar, V. D., viscosity of air, 4376
Makinson, R. E. B., heat conduction of metals, 3759
Mal, S., thunder, 3629
Malan, D., lightning, 131
Malatesta, S., electron telescopes, 3390
Malavard, L., flow lines, 1437; photoelasticity, 947
Malis, L., thermodynamic scale, 2932
Malkin, I., stability of motion, 1460
de Mallemann, R., magnetic rotation of HF, 4469
Malov, N. N., self-polarising bodies, 3861
Malsch, J., ultra-short waves, 367
Malter, L., distillation pump, 1475
Malurkar, S. L., fluid layers heated from below, 565
Malyschev, V. S., H_2O spectrum, 3715
Mamotenko, M., electron affinities, 2029
Manarini, M., acceleration, 4340
Mandel, H., field theory, 3580
Mandel, J., equilibrium in plastic media, 1421
Mandell, W., resonance in crystal beams, 2642
Mandeville, D. C., conductivity of KCl solutions, 1289
Mandò, M., noise in amplifiers, 3426
Manegold, E., diffusion syphon, 2253; porosity, 443
Manley, G., Greenland expedition, 2367
Manley, J. H., neutron scattering, 4226
Mann, C. A., electrolysis of perchlorates, 1723
Mann, K. C., supraconductors, 1711, 5032, 5033
Mann, M. M., Jr., electron velocities, 1308
Mann, W. B., disintegration of Zn, 4888
Manning, M. F., self-consistent field for Fe, 1842
Manning, W. M., photochemistry, 4485
Mano, G., masses of light nuclei, 11
Manson, N., liquid jets, 2272
Manzoni-Ansidei, R., pyrrol, thiophene and furane spectra, 4523; Raman spectra of hydrocarbons, 227
Marcelin, A., viscosity of oil, 4826
March, A., minimum wave-length, 628; space structure, 4800
Marchlewski, L., u.v. absorption by organic substances, 223
Marcuvitz, N., distillation pump, 1475
Margaritov, V. B., rubber sols, 2215, 2219; solvation of rubber, 410
Margenau, H., α-ray theory, 4457; binding energy of Li^6, 4736; nuclear calculations, 2
Mariani, J., terrestrial and solar magnetic fields, 2815
Mariëns, P., sound absorption in CO_2, 2105
Marinelli, L. D., X-ray dosage, 3030
Marinesco, N., ultrasonic centrifuge, 3455
Mark, H., rubber, 2223; structure of cellulose and rubber, 1389
Marriage, A., Sabattier effect, 1159
Marsac, H., u.v. absorption of CS_2, 1205
Marsat, A., photometry of projectors, 4922
Marsden, J., monolayers, 2738, 3982
Marsh, A. E. L., thermochemistry of $HClO_4$, 769
Marshak, A., X-ray dosage, 893
Martin, A. E., absorption of CH_2, 3710
Martin, A. R., vapour pressures of alcohol-heptane mixtures, 2953
Martin, E., γ Cassiopeiæ, 2769
Martin, K., Marsch compass, 1109
Martin, W. E., conductances of KCl solutions, 2568
Martin, W. H., Raman spectra of hydrochlorides, 1657; Raman spectra of oximes, 1658
Martinot-Lagarde, A., turbulent flow, 456
Marvel, C. S., solubility of haloforms, 3106
Masaki, O., CdI spectrum, 4936
Masek, R., micromanometer, 1849
Masiko, M., energy levels, 3249

Mason, C. C., instrument design, 4644
Mason, C. M., activity coefficients, 3791
Mason, R. C., adsorption of Hg vapour, 1482; carbon arc, 3800; reflection by Hg, 3697
Massey, H. S. W., annihilation of positrons, 3389; electron pairs, 2600; neutron-proton interaction, 336; properties of He, 4997; scattering of α-particles, 3643; upper atmosphere, 130
Massopust, L. C., infra-red radiation, 737
Masurenko, D., electron scattering, 1310
Matheson, H., boiling points of hydrocarbons, 2520
Matheson, M. S., fluorescence of acetone, 4089
Mathias, E., constants of Kr, 438
Mathieu, J. P., colours of beetles, 3217; optical properties of films, 3696; reflection of polarised light, 1624
Mathieu, S., magnetic properties of $Fe(OH)_3$, 3399, 3846
Mathisson, M., new mechanics, 969; spinning electron, 970
Mathur, K. B., ionosphere, 3419
Matossi, F., infra-red reflection of glasses, 2032, 4942; recent work in infra-red, 4562; structure of glasses, 736
Matricon, M., self-consistent field, 1841, 3094
Mattauch, J., nuclear structure, 3
Matthijs, C. J., thermo-e.m.f.s of supraconductors, 1366, 3040
Mattler, J., photon counters, 2437
Mattoon, R. W., dipping mechanism for films, 1867
Mauchly, J. W., air potential gradient, 578; terrestrial solar relationships, 582
Maurer, R. J., solubility of Ag in Hg, 2293
Maurer, W., cosmic rays, 593; disintegration of B, 142; energy of neutrons from B, 600
Maxfield, F. A., glow to arc transition, 4197
Maxwell, L. R., killing of seeds by X-rays, 5069
May, A., potential energies of alkali halides, 4758
May, J., h.f. sound in capillary tubes, 2959
Mayall, M. W., eclipsing star, 1059
Mayer, J. E., condensing systems, 979; vapour pressures of alkali halides, 2952
Mayneord, W. V., Ra depth doses, 5071
de Mayolo, S. A., materialisation of photon, 2414
Maze, R., cosmic rays, 2852, 3212, 4083
Mecke, R., dipole moment and infra-red absorption, 707; photographic emulsions, 661
Medi, E., earth's electric field and radiation, 4441; ionisation by evaporation, 129
Meek, J. M., spark discharge, 2544
Mees, C. E. K., photography, 4489
Mees, G., solubility of Au in Hg, 2294
Megaw, H. D., expansion of crystals, 4982
Meggers, W. F., LuO spectrum, 1209; Yb spectra, 199
Meidinger, W., AgBr gelatin emulsions, 175
Meihuizen, J. J., constants of Kr, 438
Meijering, J. L., complexity of Al_2Cl_6, 4282; complexity of P_2O_5, 4281
Meinel, H., violin, 5007
Meinesz, F. A. V., earth's plasticity, 113; pendulum observations at sea, 48, 3075
Meinhardt, H., positive column, 4194
Meissner, K. W., MgI spectrum, 2020, 2022
Meissner, W., polyphase systems, 2513
Meitner, L., disintegration of Th, 3640; trans-uranium series, 3639
Meixner, J., tube counter data, 815
Mellon, M. G., tristimulus values, 623
Mellor, D. P., dipyridine chlorides of Mn and Co, 3887
Meloche, V. W., polarographic wave heights, 4219
Melotte, P. J., opposition of Eros, 517
Melville, H. W., chemical reactivity, 4099; photochemical polymerisation, 170
Mémery, H., solar activity, 2780
Mendelssohn, K., cryostat, 2938; reciprocity law, 4492; supraconductivity, 4205
Mendes, F., Lα satellites of 82 (Pb), 2059
Mendousse, J., diving glasses, 4568
Menzel, D. H., eclipse equipment, 1006; gaseous nebulæ, 3137, 4385, 4836; microdensitometer, 1007; Nova Pictoris, 4006; solar reversing layer, 1535
Menzer, G., crystal lattices, 3457; Ni and Ag films, 3467; twinning in Ni, 3465
Menzies, A. W. C., dissociation pressure of $CuSO_4 \cdot 5D_2O$, 1253; solubilities in D_2O, 73; vapour pressure of benzene, 791
Mercanton, P. L., seismograph, 4050
Mercier, A., proper energy of electron, 2996; terrestrial globe, 1893
Mercier, J., solid friction, 503
Merideth, G. T., γ-ray ionisation, 3202, 3203, 4895
Merlin, E., fluid motion, 454
Merrill, P. W., interstellar lines, 525, 1517; stellar radial velocities, 2761
Merz, L., moving-coil galvanometer, 4633
Meščerjakov, M. G., neutron absorption, 3008
Meschter, E., electron microscope, 871
Meservey, A. B., depth effects in X-ray films, 2183

Mesnage, P., CaI_2, SrI_2 and BaI_2 spectra, 3719
Meuron, H. J., atmospheric nuclei, 4430
Meyer, E., acoustics, 5020
Meyer, E. J., stellar photometry, 2329
Meyer, F. R., colloidal Au, 2232
Meyer, H., H and He canal rays, 818
Meyer, K. H., nitrocellulose-cyclohexanone system, 2691; structure of cellulose and rubber, 1389
Meyer, S., age of the sun, 542, 2781
Meyer, W., oxide semiconductors, 837
Meyer zur Capellen, W., calculating devices, 3089
v. Meyeren, W., A^+ spectrum, 1645; low-pressure excitation of gases, 1270
Meyer-Gossler, G., crystallographic radii, 4754
Meyerovitz, E. A., electric and magnetic fields, 886
Michaelis, L., duroquinone system, 3852
Michaelson, J. L., spectrophotometer, 4965
Michailoff, G. M., viscosity of *p*-azoxyanisole, 1880
Michalke, H., Raman lines of crystals, 2914
Michel, A., structure of CdO, 3471; thermomagnetic anomaly, 3021, 4234
Michel-Lévy, A., explosion spectra, 3241; spectra of metals, 735
Michels, A., Curie point of Ni-Cu alloy, 356; liquid He II, 1235; molecular interaction, 404; refractive index of CO_2, 194
Michels, W. C., accommodation coefficients, 245; two-valve voltmeter, 824
Michnewitsch, G. L., crystallisation of under-cooled liquids, 1797
Mierdel, G., electrophysics of gases, 2557
Miers, F., X-ray distribution, 3412
Miescher, E., FeCl spectrum, 4947
Mihal, N., earth's moments of inertia, 4418
Mihul, C., ionosphere, 3874
Mihul, I., ionosphere, 3874
Mikhalev, P. F., soil freezing, 1542
Mikrjukov, V., turbulent flow, 2270
Miles, F. T., dissociation pressure of $CuSO_4 \cdot 5D_2O$, 1253; solubilities in D_2O, 73
Miley, H. A., copper oxide films, 497
Miller, B. J., Melde and Kundt experiments, 2098
Miller, C. W., vacuum relay, 3539
Miller, F. D., galactic structure, 1048
Miller, J. C. P., electroosmosis, 24
Miller, J. G., h.f. capacitance measurements, 1297
Miller, J. J., structure of Cs_2CrO_4, 2241
Miller, L. F., pyrheliometer, 2357
Miller, M. A., Al_2O_3 hydrosols, 1770
Milleret, H., glow-discharge electrolysis, 3824
Milligan, W. O., coagulation, 1778; ferrocyanide gels, 4752
Millikan, R. A., cosmic rays, 1141, 2854; fundamental constants, 2997, 3832
Millington, G., radio waves in ionosphere, 4261
Millman, P. M., meteor photographs, 1013
Millman, S., nuclear moments of In, 1644
Milne, E. A., equations of electromagnetism, 2178; linear equivalence, 2752; stellar luminosity, 519; uniform time, 2321
Mimura, Y., wave geometry, 1838, 4805, 4806
Minangoy, R., light filters, 4564
Minaw, F., simultaneous radio transmission and reception, 2639
Minder, W., air equivalent of γ-radiation, 148; natural radioactivity, 4881
Mindlin, R. D., optically unbalanced polariscope, 448; stresses in suspended disc, 4777
Mineo, C., liquid rotating stars, 1521
Mineur, H., galactic clouds, 1053; galactic rotation, 108; potential of galaxy, 3156; stellar clusters, 528
Minnaert, M., solar spectrum, 2350; spectrophotometry, 3245
Mirlis, D. I., corrosion of metals, 78, 3976
Misener, A. D., supraconductivity, 2561, 3808; surface tension of He, 2302
Mishima, T., chemical action of excited H_2, 3351; H and D spectra, 2449, 4511
Mitchell, A. C. G., induced radioactivity of In, 1570; isomers of In^{116}, 1764
Mitchell, D. P., regulators for electromagnets, 887
Mitchell, H. R., resistance of metal films, 1288
Mitlacher, M., air currents in closed vessels, 2818
Mitra, S. K., upper atmosphere, 2794
Mitra, S. M., Raman effect in boric acid, 2908; Raman effect in cyclohexane, 2912
Mittasch, A., causality in nature, 1848
Miyabe, N., sea levels, 2786
Miyadzu, A., vortices, 1434
Miyake, S., structure of Sb_2O_3, 3120
Mixter, G. W., navigation, 3990
Mizushima, S., resonance and internal rotation, 2049; vibrations of ethylene halides, 2050
Moberg, E. G., Ra in sea water, 4422
Mochan, I., synthesis of NH_3, 822
Möglich, F., semiconductors, 3813; spin phenomena, 3959
Möhring, H., conductivity of Cu-Se alloys, 308
Möller, J., psychrometer, 1556
Moeller, K., Al-Mg system, 3909

Möller, W., hydrodynamics of sphere, 1435
Moelwyn-Hughes, E. A., reaction kinetics, 786
Moerman, N. F., structure of $CH_3.COH.NH_3$, 1407; structure of $(HCNO)_3$, 2681
Mohler, F. L., Hg afterglow, 168
Mohr, C. B. O., scattering of α-particles, 3643
Mohr, J., Magellanic clouds, 1050; photometry of stars and clusters, 1525
Mohr, J. M., distances of B-stars, 1513
Moignard, L. A., lubrication of taps, 500
Mokhtar, M., organ pipes, 2954
Moles, E., densities of O_2 and CO_2, 3486; density of SO_2, 3064; limiting densities, 943; molecular weights of gases, 1801
Moll, W. L. H., aerosols, 22
Mollet, P., infra-red technique, 687, 1163
Molstad, M. C., evaporation of water, 4601
Monroe, E., two-centre problem, 3533
Montgomery, C. G., cosmic rays, 1139, 3661
Montgomery, D. D., cosmic rays, 1139, 3661
Monval, P. M., equilibrium of liquid mixtures, 1248
Mookerjee, B. K., light scattered by mixtures, 2873
Mookherji, A., magne-crystallic action, 2176; magnetic anisotropy of $CuSO_4.5H_2O$, 4311
Moon, C., absolute ohm, 5031
Moon, P., dielectric bolometer, 2859; Planck's function, 1592; reflection factors, 4108
Moon, P. B., slow neutrons, 1313
Mooney, R. C. L., structure of NH_4BrICl, 933; structure of potassium tetrachloriodide, 1401
Moore, C. E., stellar parallaxes, 2760
Moore, D. G., surface tension of enamel, 4359
Moore, K. H., structure of Cu surfaces, 4363
Moore, W. J., Jr., monomolecular films, 3122
Moorkens, M., surface conductivity, 4636
Morand, M., Cu-Ni alloys, 3462
More, K. R., laboratory furnace, 3279; spectra of NiCl, CoCl and FeCl, 3724; SrCl and SrH spectra, 2894; TiCl spectrum, 217
Moreau, H., quartz-mercury thermometer, 768
Moreau-Hanot, M., transport of ions in gas, 2543
Morey, G. W., optical glass, 682
Morgan, J., structure of water, 4763
Morgan, J. C., oscillograph circuits, 3417
Morgan, K. Z., cosmic rays, 4081
Morgan, W. W., colour indices of stars, 2338
Morin, H., relaxation oscillator, 3415
Morinaga, K., wave geometry, 1838
Morino, Y., vibrations of ethylene halides, 2050, 2051
Morita, N., diffusion of H_2O^{17} in gelatin, 4313; isotopic ratio in water, 3490; 3491
Moritz, H., solubility of gases in Fe, 4812
Morkovko, I. P., potential at metal surfaces in solutions, 840, 841
Morkowska, K., spectra of p-p-dioxydicinnamyl-methane solutions, 1214
Morrell, J. C., hydrocarbon research, 261
Morris, R. M., aerofoils, 952
Morrison, J. L., adsorption of alkalis, 3550; heats of wetting of cellulose, 489
Morss, H. A., Jr., structure of rubber, 1391
Morton, T. H., photosensitisation, 3684*
Mosallam, S., adsorption on mica, 1858, 2731
Moser, H., thermal measurements, 1245
Mosimann, H., Maxwell effect, 4746
Moss. R., atmospheric optical phenomena, 3626
Moss, W., solar eruptions, 3600
Moszkowicz, O., atmospheric ionisation, 2809
Mott, N. F., conduction in polar crystals, 1708; energy levels in crystals, 3904; latent image, 665; light absorption by crystals, 4069; photochemical processes, 3678*; photoconductivity 1357; photographic emulsions, 2428
Motz, H., space-time, 1834
Moubis, J. H. A., neutron tube, 347
Moulin, A. M., X-ray ionisation, 2917
Moullin, E. B., melting points, 3766
Moussa, A., radioactive Ag, 2387, 3635
Moyer, L. S., electroosmosis, 1776
Mrowka, B., thermionic emission, 1360
Mrozowski, S., fluorescence of I_2, 160; fluorescence of metal vapours, 4092 hyperfine structure of Hg, 1641; Hg fluorescence, 724
v. Müffling, L., explosive processes, 4992 flame velocities, 770
Mühlenpfordt, J., conductivity of films, 4642; thermionic emission, 3430
Mülbach, E., photographic action of X-rays, 752
Müller, A., dielectric polarisation of ketones, 2575
Müller, E., passivity of Cr, 852; Pd kathode in CrO_3 solutions, 1727
Müller, E. W., electron microscope, 3429
Müller, F., Cd electrode, 4221; valve electrometer, 5030
Müller, F. H., dielectric loss, 4657; dielectric polarisation in liquids, 2143
Mueller, H., elasto-optical constants, 2960; light scattering, 2867

Müller, I., X-ray absorption, 4158
Mukherjee, H., frequency oscillator, 3871
Mukherjee, K. K., scattering of particles by atoms, 340
Mukerji, B. C., rotating spheroidal mass, 1027
Mukherji, P. C., fluorescence of rare earths, 4143; spectra of Nd^{+++} ions, 695; spectra of Pr^{+++} ions, 1650
Mukerji, S. K., As spectrum, 1642; Raman spectrum of diphenyl, 4555
Mulder, P. J., phosphorescence in CaS, 2426
Muller, G. G., diffraction of sound, 3325
Muller, H., freezing points of solutions, 4985
Muller, P., astronomical micrometer, 1003; double star measures, 1883
Muller, R. H., analytical balance, 3944
Mund, M. W., chemical thermodynamics, 2517
Murakawa, K., HgI spectrum, 1183; I and Cl spectra, 2883
Muraour, H., explosion spectra, 3241; law of combustion, 3314; spectra of metals, 735; transformation of band to continuous spectra, 3271
Murdock, C. C., Laue photographs, 3055
Murlin, J. R., calorimeter, 1672
Murphy, E. J., Geiger-Müller counter, 892
Murphy, G. M., Raman spectra of H_2S and D_2S, 3739
Murray, H. D., colour filters, 3225
Muskat, M., reflection of plane wave pulses, 2013
Mussmann, H., crystals in magnetic field, 3400; elastic and optical after-effects, 1422
Mustel, E. R., stellar atmospheres, 1519
Muto, K., geoid, 2782; sea levels, 2786
Muto, T., structure of alloys, 2669; thermoelectric properties of alloys, 4269
Muto, Y., adsorption of organic ions, 4355
Myers, R. D., resonance disintegration, 4056

Nadile, A., forced vibrations, 3070
Nadjakoff, G., photoelectrets, 3037
Nagaoka, H., chemical action of excited H_2, 3351; H and D spectra, 2449, 4511
Nagasima, H., exploded bodies, 4342
Nagata, S., fibre structures, 1775
Nagata, T., earth's magnetic anomalies, 3630; subterranean structure, 4022, 4853
Nagel, K., ideal cell, 320; ionic transference, 4662
Naggiar, V., surface tension, 3551
Nagy, J., triode voltmeter, 4631
Nahmias, M. E., β-ray absorption, 2832
Nakabayasi, K., β-decay theory, 1961
Nakagawa, S., γ-ray activity induced in Cd, 2828
Nakamura, T., hydrophilic properties of cellulose, 3450
Nakano, M., tides in bay, 546
Nakaya, U., artificial snow, 4858
Namekawa, T., wind vector, 2358
Narath, A., photographic paper, 1618
Narayan, A. L., solar activity, 1924
v. Náray-Szabó, S., H_2 overvoltage, 1728
Nardin, P., interfacial tension, 3978
Narlikar, V. V., Riemannian tensors, 3949
Nassau, J. J., Messier 92, 1913
Natanson, N. E., colloidal silicic acid, 919
Nath, N. S. N., diffraction of light by h.f. sound, 2534; transmission of h.f. sound, 4187
Nathanson, J. B., optical constants, 190, 4109
Naudé, S. M., CH_3F spectrum, 207
Naumann, H., monochromatic filters, 1130
Nayar, P. G. N., Raman spectrum of pentaerythritol 2475
Nazmi, F., heat capacity of C_2H_6, 754
Nebbia, G., stream flow, 1819
Nedungadi, T. M. K., organic glasses, 4304
Néel, L., Curie point of rare-earth metals, 1329; molecular field of ferromagnetics, 350; paramagnetism of electrons, 3395
Neeland, G. K., rotating beacons, 3746
Neher, H. V., cosmic rays, 641, 1141, 2854
Nekrassow, N. I., ignition of NH_3 and N_2-H_2, 1247
Neldel, H., oxide semiconductors, 837
Nelson, E. B., optical activity of $NiSO_4$, α-$6H_2O$, 4107
Nelson, H. R., oxidation of Fe, 4823
Nelson, J. H., head-lights, 4501; magnetometers, 3405; trichromatism, 3752
Nelson, R. B., engine for smoothing wires, 4268
Němejcová, A., Laue diffraction photograms, 4571
Nernst, W., temperature of universe, 2751
Neubauer, F. J., opposition of Eros, 518
Neuberger, H., solar activity and haloes, 1092
Neubert, P., photo-thermometry, 1674
Neubert, U., h.v. generator, 4686
Neuert, H., breakdown in vacuum tubes, 2546; ionising power of atomic nuclei, 596; ionising power of Li-particles, 138
Neugebauer, H. E. J., colour production, 1132
Neugebauer, T., molecular polarisability, 1843; van der Waals forces, 780

Neumann, F., accelerogram analyser, 1943
Neumann, H., permanent-magnet alloys, 4236
Neumann, K., boundary kinetic processes, 3517 ; rhythmic precipitation, 3903
Neumann, M. B., ignition of hydrocarbons, 3776
Neumann, W., tension in rubber, 3923
Neumark, W., crystallisation nuclei, 33
Nevgi, M. B., paramagnetism of Fe group, 1738
Neville, H. A., drops on liquid surfaces, 495
Newell, R. R., radiography of lungs, 2185
Newing, S. T., finite strain, 4775
Newman, E. S., transition of $CaSO_4$, 2939
Newton, H. W., solar activity, 1927
Newton, R. F., heat capacity of glycerol, 755
Nicolet, M., cometary spectra, 1886, 3987
Nicoll, F. H., electron mirror, 4683
Nicolsky, B. P., glass electrode, 325
Nicolsky, V. A., moments of inertia, 2707
Nidetzky, G., exposure-meters, 2434
Nielsen, A. H., absorption of OH group of phenol, 709 ; CD_4 spectrum, 3723 ; infra-red absorption of $C^{13}O_2^{16}$, 3253
Nielsen, H. H., CD_4 spectrum, 3723 ; CO_2 spectrum, 1195 ; D_2CO spectrum, 2895
Nielsen, W. M., cosmic rays, 4081
de Niem, G., dipole in earth's surface, 1108
Nier, A. O., isotopes, 1371, 3438, 3440
Niessen, K. F., phase of magnetic field, 4235
Niethammer, T., time and azimuth determinations, 4373
Nikiforov, V. K., periodic reaction of $Ag_2Cr_2O_7$, 1393
Nikitin, S., β-spectrum of ThC, 4459 ; flow dichroism, 673 ; photodichroism, 2875, 4498, 4925
Nikliborc, J., penetration of H_2 through Hg, 3493
Nilakantan, P., magnetic anisotropy of wood, 1735 ; pleochroism of mica, 4693
Nims, L. F., silver-silver azide electrode, 1726
Nishimura, G., seismic waves, 4047
Nishina, T., magnetisation of Fe monocrystals, 4240
Nishina, Y., cosmic rays, 632
Nisimura, E., change of plumb line, 1506
Nisimura, Y., standing wave in water, 3795
Nitka, H., allotropy of Ge, 30 ; $\alpha\rightleftarrows\beta$ transformation in Mn, 2670 ; Mn ferrites, 2620 ; Ni-Pt alloys, 3018 ; X-ray screens, 3407
Nitta, I., structure of $C(CH_2OH)_4$, 1792
Niwase, Y., effect of h.f. sound on colloids 415
Nix, F. C., order-disorder in alloys, 1788 ; superlattices, 423
de Nobel, J., conductivity of W single-crystal, 2501
Nöldge, H., Cu_2O rectifiers, 3807
Nöller, W., excitation of He lines, 4517
Nörlund, N. E., figure of earth, 3163
Noma, S., X-ray spin-doublets, 4972
Nomura, Y., waves on water, 3080
Nonaka, I., production of X-rays, 1667
Nordheim, G., heavy electrons, 3831
Nordheim, L. W., cosmic rays, 2422 ; heavy electrons, 3831
Norling, F., neutron absorption in B and Li, 2157
Norman, D., photographic plates, 2000 ; wood replica gratings, 2317
Normand, C. W. B., atmospheric instability, 1084, 1085, 2362
Norrish, R. G. W., decomposition of H.CHO, 169 ; photographic reversal, 3689 ; structure of poymers, 6
Noskov, M. M., Hall effect, 2613, 2614
Nottingham, W. B., luminescence of willemite, 166
Novikoff, P., potential, 1457
Nowacki, W., classification of solids, 4755 ; structure of EuS, 3474
Nowotny, H., Cr-As system, 1397 ; Mn-P system, 930 ; Ni-P system, 3463
Noyes, A., Jr., magnetostriction oscillator, 1699 ; sound transmission over reflecting surfaces, 799 ; supersonic research, 1258 ; vibration of cones, 2526
Noyes, W. A., Jr., decomposition of H.CHO, 169 ; fluorescence of acetone, 4089 ; photodecomposition of Et-CO-Me, 4488 ; photodecomposition of N_2O, 4096
Nuckolls, R., internal friction in solids, 505
Nuovo, M., electronic voltmeter, 1278
Nuttall, A. K., electron microscope, 3010
Nutting, G. C., surface tension of soap solutions, 79
Nyström, E. J., harmonic analyser, 2276
Ny Tsi-Zé, Rb and Ce bands, 3256 ; Rb principal series, 202 ; vibration of quartz cylinder, 2096
Nylén, P., electrometric behaviour of Pd_2H, 843 ; pH measurement, 844

Oblad, A. G., heat capacity of glycerol, 755
Obnorsky, A., thermodynamic scale, 2932
Obrist, J., Liesegang rings, 413
Obrutschewa, A., potential of Pt in Ag solutions, 4667
Occhialini, G. P. S., non-ohmic resistance, 1715

O'Ceallaigh, C., disintegration of B, 3197
Ochiai, K., proton-deuteron collisions, 861
Ockelford, C. W., transparency of windows, 3281
Ockenden, F. E. J., voltmeter, 301
Oehler, H., divided circles, 4333
Öhman, Y., H absorption of cA stars, 523; spectrograph, 1005; white dwarfs, 1040
Ölander, A., electrochemical data of alloys, 323
Oelke, W. C., solubility of lanthanum iodate, 984
Öpik, E., meteors, 1012
Oertel, L., ferromagnetism, 1323
Ogawa, E., rotatory power of *l*-menthol, 1166
Ogorodnikoff, K., star counts, 3596
Ohl, E. N., adsorption by graphite, 3110
Ohlin, P., X-ray intensities, 4160
Ohmori, K., rhythmic precipitation, 412
Oka, S., cylinder in stream, 1823; equation of ultracentrifuging, 923; polar liquids, 3366; strong electrolytes, 1685
Okamoto, G., H_2 electrode, 2147
Okaya, T., force on plate in stream, 4324; fracture of glass, 4320; rhythmic precipitation, 412, 1780
Okazaki, A., Faraday effect, 626
Oketani, S., structure of S, 934
Oldenberg, O., kinetics of OH radicals, 3726; radioactive Ta, 604
Ollano, Z., absorption of β-rays, 136
Olsen, L. O., formation of HgH and HgD and excitation of CdD, 2870; Melde and Kundt experiments, 2098
Olsson, E., electron terms of O_2-like molecules, 1202; isotopic molecules, 2045; predissociation of S_2, 1200, 2898
Onoyama, D., Fraunhofer's diffraction phenomenon, 1608
Onsager, L., recombination of ions, 5025
Oosterkamp, W. J., X-ray tube, 4155
Oosterman, J., electrophoresis, 2661
Opalski, W., SU Draconis, 4846
Opechowski, W., hyperfine structure of Hg, 3709
Oppenheimer, J., electron and positron scattering 4671
Oppenheimer, J. R., $B^{11}+H^1$ reactions, 1958
Ormont, B., valency, 4277
Ornstein, L. S., Cd spectrum, 1640; electron diffraction patterns, 3837; reflecting power of alloys, 1628; reflectivity of corrugated surfaces, 192
Orr, W. J. C., heats of adsorption, 4818
Oseen, C. W., relativity, 981
Osterberg, H., Joule-Thomson coefficients, 1684
Osterhammel, K., h.f. sound interference, 278
Ostertag, H., space, 1465
Osterwisch, H., tube counters, 4896
Ostrovskij, A. E., elastic vibrations, 1423
Ostwald, W., colorimetry, 3208
Ostwald, Wo., colloid particle weights, 15; Lloyd effect, 2252
Otis, W., internal friction in solids, 505
Otpushtshennikov, N. F., h.f. sound absorption, 2103
Ott, H., Kossel effect, 1395
Otto, J., gas-content of bottles, 1682
Ouang Te-Tchao, large and small ions, 823; mobilities of large ions, 1701; X-ray ionisation, 2917
Ough, L. D., Ag- $Ag_4Fe(CN)_6$ electrode, 1302
Overbeek, J. T. G., dielectric constants of colloids, 833
Overhage, C. F. J., photoelectrons from Na, 376
Owen, B. B., conductance of HCl in dioxane, 5034; KCl-LiCl and HCl-HBr mixtures, 264, 265; liquid junction potentials, 4664
Owen, E. A., Ag-Zn alloys, 4295; superlattice in alloys, 1790
Ozaki, S., electron pair creation, 2154

Packard, C., radium dosage, 3411
van Paemel, O., velocity of sound in A and D_2, 5009; velocity of sound in O_2, 3331
Paetow, H., impact of Cs ions on W, 4267
Page, C. H., Van der Waals forces, 1467
Page, L., electrical oscillations of spheroid, 3034
v. d. Pahlen, E., solar granulation, 3599
Paić, M., glass electrode, 3827; sedimentation, 4749
Pailloux, H., fluid motion, 3934; membranes, 2692, 3067
Pajeau, R., Raman effect in benzene derivatives, 4146
Palkin, S., manometer, 3537
Pall, D. B., heat capacity of C_2H_4, 4162
Pallu, L., monomolecular films, 3554
Palmer, E. H., rectifier photo-cells, 5079
Palmer, G., heat conduction in liquids 3299
Palmer, K. J., rotation in $C_2H_4Cl_2$, 4646; structure of Al halides, 3890; structure of NOCl and NOBr, 402; structure of SeO_2, 3046; structures of chlorobenzenes, 8; structures of S, V and Cr Compounds, 4739
Palmer, W. G., films on silica, 4354
Panay, T. N., intensities of spectral lines, 2903
Paneth, F. A., He in beryls, 1954, 1955
Pannekoek, A., H lines near Balmer limit, 4850
Pant, B. D., ionosphere, 3872

Papkov, S., heat of sorption on nitrocellulose, 490; highly-polymerised solutions, 3108
Paranjpe, G. R., dielectric properties of organic substances, 4648
Paranjpe, M. M., solar constant, 3607
Paraskevopoulos, J. S., nebula NGC 1982, 3992; southern clusters and nebulae, 1051
Parker, A. E., theatrical lighting, 4565
Parker, A. H., TiCl spectrum, 217
Parker, H. M., interstitial radium therapy, 2187, 2633
Parker, R. C., fatigue in auditory system, 286
Parkinson, D. B., disintegration of F., 4452; electrostatic generator, 2162
Parks, W. G., La amalgam electrode, 2584
Parodi, M., infra-red transmission of oxides, 233; infra-red transmission of ZnS, 738; spectrometer, 3743; transmission of benzene derivatives, 1666; vibrations of fluorides, 3270
Parratt, L. G., L-series of Ag, 3755
Parrin, F., α-particle emission, 4060
Parthasarathy, S., velocity of sound, 1696
Partington, J. R., dipole moments, 3820, 4653, 5039
Paschen, F., In I spectrum, 2456; In II spectrum, 1189
Pasquill, F., charges on raindrops, 133
Passynski, A., compressibility of electrolytes, 2730
Paterson, R., interstitial radium therapy, 2187
Patrick, W. A., melting of compounds adsorbed on silica gel, 2073, 2074
Patry, J., light propagation, 2846
Patry, J. F. C., grating theory, 2961
Pattabhiramayya, P., optical anisotropy of O_2, 2446; Raman effect in $NaNO_3$, 2474
Patterson, G. R., magnetic permeability, 4691
Pauli, W., Congo-dye sols, 3899; long-wave light-quanta, 4076
Pauling, L., structure of $Cs_2AuAuCl_6$, 3914; structure of di- and trigermane, 3441
Pauthenier, M., h.v. atomic disintegration, 4066; h.v. generators, 4203
Pavel, D., efflux at orifices, 1825
Pavelka, F., colloidal graphite, 4357
Pavlik, B., oscillating elliptic plate, 274
Pavlova, E., solar spectrum, 3602
Pavlović, V. H., colour mixtures, 153
Pawlow, W., recrystallisation, 34
Payman, W., explosion waves, 772
Payne-Gaposchkin, C., Nova Herculis, 1915; Nova Pictoris, 4006; red indices of stars, 1041; stellar magnitudes, 1895, 4010
Payne-Scott, R., scattered X- and γ-rays, 889
Pearce, J. A., Nova Lacertae, 1914
Pearce, J. N., adsorption of ethers by C, 1483; $Ag\text{-}Ag_4Fe(CN)_6$ electrode, 1302; solubility of lanthanum iodate, 984; spectra of $CoCl_2$ solutions, 1651
Pearce, R. R., paramagnetism of Co and Fe, 3856
Pearlman, H., small voltage measurement, 3353
Pearse, R. W. B., CdF spectrum, 3727; MnH spectrum, 1652; photographic sensitivity, 1157; vacuum spectroscopy, 1223
Pearson, J. D., adsorption on Pt electrodes, 4220; passivation of Au, 3381
Pease, E. M. J., distillation of complex mixtures, 2092
Pecherer, B., exchange of D between CH_3OH and D_2O, 4598
Peczalski, T., sublimation of salts, 3324
Pedersen, K. J., reaction kinetics, 786
Peierls, R., nuclear reactions, 2395; potential barriers, 470
Pekeris, C. L., stellar oscillations, 4001
Pelton, M. O., spectrographic irradiators, 2480
Penndorf, R., ionosphere, 373
Penney, W. G., electronic structure of molecules, 905
Penning, F. M., electron current in electric field, 2110; neutron tube, 347; neutrons, 3833
Peoples, J. A., Jr., Zeeman effect in Ne spectrum, 4963
Peracchio, E. S., polarographic wave heights, 4219
Perakis, N., Ag-Cd and Cu-Cd systems, 2164; atomic moment of Re^{IV}, 3402
Pérard, A., luminous wave-lengths, 1634
Percival, E. G. V., structure of carbohydrates, 827
Pérès, J., flow lines, 1437
Peristerakis, S., X-ray scattering, 4969
Perlick, A., refrigerants, 758
Perlinghi, O., spectral analysis of Pb alloys, 1177
Perret, F. A., seismeter, 127
Perrier, C., time-temperature curves, 1242
Perrier, F., radiation by electrified insulators, 1600, 1974
Perrin, F. H., achromatism, 1630
Perrin, M. W., reaction kinetics, 786
Perry, J. W., monochromators, 1146; objective colorimetry, 3657
Persico, E., ionisation and discharge cross-sections, 3382; positive rays, 1272, 4201; Wentzel-Brillouin method, 4344
Pertz, H., radioactivity of springs, 2385
Perucca, E., electrometers, 2612; glare, 3282; metal films, 2564; Volta effect, 349
Perutz, M., snow crystals, 3174
Peschel, H., levelling rods, 1446

Péter, G., constants of Sr and Ba, 1394
Peters, P. E., adsorption of ethers by C, 1483
Peterschmitt, E., earthquakes, 573
Petiau, G., Dirac and photon equations, 2285, 3091; Dirac electron theory, 3093
Petralia, S., emission photo-cells, 1351
Petrie, R. M., eclipsing binaries, 3159; Nova Lacertae, 1914
Petrucci, G., electric charge of earth, 2379, 2380
Petržilka, V., vibrations of quartz plates, 797
Pettersson, H., scattering of Po α-particles, 1120
Pettit, E., solar prominences, 4411
van Peype, W. F., magnetic anisotropy of crystals, 3397
Peyrot, P., Raman spectra of hydrates, 4144; Raman spectra of powders, 2476; Rayleigh scattering, 2866
Pfeiffer, H., polarising plates, 4926
Pfund, A. H., Raman effect apparatus, 3741; thermopiles, 253
Philipp, E., scattering of neutrons by protons, 863
Philippoff, W., viscosity of sols, 1784; viscous flow, 2658
Philipps, H., vortices, 4035
Phillips, L. R., binocular summation, 2054
Phillips, L. W., Cl VII spectrum, 1184
Phillips, N. W. F., decomposition of ethane, 1998, 4917; Hg resonance radiation, 4077
Phillips, R., h.v. X-ray therapy, 3863
Phipps, T. E., halogen films on W, 386
Picard, M., international ohm, 3355; potentiometer, 2131
Piccardi, G., electrical phenomenon, 3822
Picht, J., mounted lenses, 678; phase contrast, 1152
Pick, H., colour centres, 1967
Pickels, E. G., visual purple, 2486
Pickering, W. H., cosmic rays, 155, 641
Piddington, J. H., ionosphere, 1348
Piekara, A., intermolecular coupling, 2141
Pielemeier, W. H., vibrations in quartz plates, 800
Pieńkowski, S., fluorescence of $C_{48}H_{36}$, 157
Pierce, G. W., magnetostriction oscillator, 1699; sound transmission over reflecting surfaces, 799; supersonic research, 1258; vibration of cones, 2526
Pierce, J. A., gramophone records, 3338
Pierce, N. H., 2-gm. Ra unit, 1753
Pierce, W. C., structure of liquids, 2246
Piercey, A. G. A., gas-liquid hydrocarbon systems, 5004
Piercy, N. A. V., skin friction, 4781
Pietzner, J., heat conductivity of gases, 244
Pietzsch, H., photo-effect in oxide kathodes, 378
Pink, R. C., water-in-oil emulsions, 4287
Pinoir, R., density of electrostatic charges, 1318
Piontelli, R., effect of h.f. sound on electrolysis, 4179
Piper, R. W., wing profiles, 49
Pipes, L. A., friction, 2748; matrix-operational methods, 1450; operational calculus, 1265, 2541, 3326; solution of variable circuits, 804; wave equation, 3947
Pirenne, M. H., structure of $SiHCl_3$, 1378
Pistocchi, A., crystal deformation, 2255
Pitschugin, A., ionic spheres of action, 3056
Pitt, A., sound velocity in He, 4606
Pitt, F. H. G., colour of photographic subjects, 1584; specular density, 3230
Pitzer, K. S., entropies of ions, 4175; heat capacity of diamond, 1234; heats of ionisation, 256; thermal data of Na_2SO_4, 3320
Pjatnizki, A., secondary emission, 3005
Planiol, R., excitation of atomic jets, 1704; h.v. generator, 4067
Plaskett, H. H., night sky, 4865
Plaskett, J. S., K-term in B-stars, 3146
Platt, J. R., interferometer mirrors, 659
Plesset, F. M., Raman spectra of nitrate solutions, 4559
Plessing, E., metal surfaces, 3980
Plimpton, S. J., wave speeds, 5008
Plötze, E., dielectric constants of organic fluids, 834; dispersion of dielectric constants, 4654
Plotnikov, V. A., galvanic cells, 4658; non-aqueous solutions, 4352
Plotnikow, M., dark room filters, 3228
Plummer, H. C., binary stars, 1055
Plyler, E. K., absorption of water at $4{\cdot}7\mu$, 2840; infra-red wave-lengths, 1635
Pochettino, A., electrification of droplets, 1317
Pochil, P. F., linear adsorption, 3114; surface layers, 1491
Podolsky, B., Dirac's equation, 1844
Pöschl, T., deflection of beams and struts, 1808
Pohl, R. W., conduction in alkali halides, 1277; photochemical processes in crystals, 2249, 3678; photocurrents in crystals, 1356; secondary photo-current, 381
Pohlman, R., dielectric properties of solid HCl, 835; particles in h.f. sound field, 803
Poirot, A., anode rays, 1271
Pokhil, P. F., two-dimensional colloids, 1381
van der Pol, B., radio wave propagation, 3035

Polanyi, M., reaction kinetics, 786
Polessitsky, A., artificial radioelements, 591; distribution of RaD, 3965
Polin, V., ion layer around probe, 2113
Politi, F. W., freezing points of solutions, 3305
Pollak, L. W., actinometer, 560 ; u.v. dosimeter, 2628
Pollard, A. F. C., amplification of displacements, 1445
Pollard, E., neutron emission, 1572 ; transmutation of Sc, 4454 ; transmutation of Ti, 4453
Polson, A., diffusion of cellulose derivatives, 2659
Pomerantschuk, I., neutron scattering, 2159
Pomeroy, L. A., Ra dosage, 2632
Poncin, H., viscous flow, 1000
Pontecorvo, B., diffusion of neutrons, 2601 ; radiative transitions, 3882 ; radioactive Cd, 4057
Pool, M. L., fast neutrons, 2391 ; induced radioactivity, 1950 ; isomerism in radiosilver, 1571 ; radioactive Ag, 605
Poole, H. G., atomic H, 300
Poole, J. H. J., Ra content of rocks, 1122 ; Rn estimation, 1123
Popp, L., transitions of solid CH$_3$D and CD$_4$, 782
Porret, D., spectra of alkyl iodides and bromides, 1655
Porter, A. W., capillary ascent, 4360 ; sessile drops, 2304
Porter, C. W., molecular rearrangement by h.f. sound, 3336
Porter, E. F., contact potentials of stearate films, 2743
Portevin, A., diffusion in metals, 3492
Potop, A., specific heats of gases, 753
Poulter, R. M., cloud forecasting, 2360
Poulter, T. C., extreme pressures, 2721
Powell, C. F., Montserrat expedition, 1102
Powell, H. M., structure of germanous iodide, 1400
Powell, R. W., heat, 1243 ; thermal conductivity of mica, 246
Power, J. R., sound absorption in rooms, 4613
Powney, J., detergent solutions, 2305
Prakash, B., magnetism of Cr compounds, 4696
Prakash, S., colour and constitution, 4903
Prandtl, L., boundary layer calculations, 1431
Prang, W., strong electrolytes, 2250
Prasad, B., viscosity of electrolytes, 3983
Prasad, M., magnetic properties of Te, 2169
Prasad, S. P., dielectric constant of space containing electrons, 313
du Pré, F. K., paramagnetic relaxation, 3854, 3855
Predmestnikow, I. I., β-decay, 2398
Predwoditelev, A., flame propagation, 2947
Press, R., negative-ion formation, 4629
Pressey, B. G., impulse generator, 2638
Preston, G. D., Cu-Al alloys, 4759 ; oxidation of metals, 2307
Preston, J. H., skin friction, 4781
Preston, J. S., photometer, 1620 ; relative luminosity, 2007
Price, L. E., tarnishing, 3830
Price, W. C., absorption spectra of SO$_2$ and CS$_2$, 2041 ; halogen acid spectra, 3725
Price, W. L., atmospheric radiation, 119
Prideaux, E. B. R., parachors, 3981
Priest, I. G., colorimetric purity, 2411
Prileshajewa, N., adsorbed acetone, 1997
Pringsheim, P., resonance radiation of N$_2$, 3272
Pritschow, K., photographic objectives, 2435
Proca, A., theory of particles, 1972
Procopiu, S., permeability of iron layers, 1326
Prosad, K., anomalous dispersion, 681 ; ash particles in air, 2666 ; spreading of liquids in thin filter paper, 4371
Proskurnin, M., Hg electrode, 5047, 5048
Proudman, J., temperature in Irish Sea, 2785
Pruckner, F., spectra of pyrrol dyes, 3714
Pryce, M. H. L., neutrino theory of light, 1978
Przibram, K., fluorescence of rare earths, 645, 646
Pschejetzkij, S. J., polarisability of atoms and ions, 65
Puppo, A., light in the sea, 1075
Purcaru, I., spark discharge, 3342
Puri, A. N., elasticity of rubber, 409
Puschner, M., thermal diffusion, 43

Quarrell, A. G., electron diffraction methods, 4227
Quevron, L., metrology, 3943
Quiggle, D., freezing point apparatus, 766
Quill, L. L., induced radioactivity, 1950
Quimby, E. H., X-ray dosage, 3030, 4710
Quimby, S. L., adiabatic change of magnetisation, 3848 ; elastic constants of Na, 3500 ; expansion of Na, 3304
Quimfe, G., colloidal goethite, 924 ; non-spherical colloidal particles, 915 ; thixotropy, 16, 914
Quintin, M., potential of Cd cell, 2583 ; radius of Cd ion, 3377 ; radius of Cu, radius of Cd ion, 3377 ; radius of Cu ion, 2144

Raaschou, P. E., viscometer, 1002
Rabe, E., minor planets, 1512
Rabi, I. I., nuclear moments of In, 1644

Rabinerson, A., u.v. emission on coagulation, 3215
Rabinovitch, A. J., photographic development, 3680
Rabinovitch, J., magnetic birefringence, 1586 ; spectro-polarimetry, 4497
Racah, G., particles and anti-particles, 331
Radoitchitch, M., spectra of Nd and Sm solutions, 1647
Radtschenko, J. V., structure of liquid metals, 1793, 1794
Raether, H., expansion chamber, 813 ; spark discharge radiation, 5024
Rahimi, M. G., conductivity of crystals, 4207
Rait, J. R., viscosity of slag systems, 1877
Rajski, S., Hg resonance line, 201
Rakshit, H., upper atmosphere, 2794
Ramart-Lucas, P., spectra of dyestuffs, 1197, 3255 ; structure of coloured compounds, 212
Ramaswamy, K. L., CO$_2$ molecule, 903
Ramdas, L. A., spreading of substances on water, 2309
Ramer, L. G., sound transmission, 5014
Ramm, W., h.f. absorption of polar substances, 5041
Ramotowski, E., distillation, 267
Ramsey, W. E., h.v. battery, 2579
Randall, C. L., X-ray dosage, 891
Randall, H. M., far infra-red spectroscopy, 2018
Rann, W. H., radium beam therapy, 1343
Ranzi, I., ionosphere, 370
Rao, A. L. S., spectrum of KMnO$_4$, 712
Rao, A. V., intensities of Raman lines, 2473
Rao, B. S., contact angles, 1861
Rao, B. S. M., Born's field theory, 3101 ; neutrino theory of light, 2842 ; reality, 1472 ; ring structure of electron, 2151
Rao, B. S. R., light-scattering in H$_2$O and D$_2$O, 1609 ; Raman spectrum of benzene, 3277
Rao, B. V. R., acoustic velocity in liquids, 2530
Rao, H. S. S., Eulerian parameters, 3528
Rao, I. R., constitution of D$_2$O, 2654 ; Raman spectrum of water, 730
Rao, K. N., Indian drums, 2097
Rao, S. R., diamagnetism of Cd, 3025 ; susceptibilities of complex ions, 353
Raquet, M. E., ripple tank photography, 2540
Raskin, A., h.v. generator, 3842
Rasmussen, E., Zeeman effect of CdI, 1217
Rassweiler, M., CsH spectrum, 2896
Rast, W., diffusion through pyrex glass, 4769
Ratcliffe, J. A., ionosphere, 375, 1756
Rathenau, G., u.v. absorption of Au and Ag, 3207 ; u.v. reflection by crystals, 2443 ; Wilson chamber, 2408
Rathgeber, H. D., cosmic rays, 3214
Rau, K. N., light diffraction by h.f. sound, 4611
Rau, M. A. G., light diffraction by h.f. sound, 4610
Ray, M., anodic behaviour of Pb, 1301 ; motion of cylinders in fluids, 2262
Ray, P., periodic table, 4274
Rayleigh (Lord), passage of He through mica, 41 ; vision 4154
Raymond, C. L., vapour-liquid equilibrium, 3788
Rayner, W. H., transit instruments, 4378
Raynor, G. V., atomic and ionic radii, 3442 ; compounds of type Mg$_2$Sn, 931
Rayton, W. B., optical glass, 683
Razouk, R. I., swelling of charcoal, 2733
Reber, R. K., duroquinone system, 3852
Reboul, G., radiation by metals, 156
Reboul, J., radiation by metals, 156
Reboul, J. A., internal ear, 3339
Rebsch, R., electron microscope, 2605
Rebuffé, L., impact, 1462
Rechnagel, A., electron optics, 2608
Record, F., thick lenses, 2444
Reddemann, H., fast neutrons, 4677
Redlich, O., normal potential of D$_2$, 2149
Redman, R. O., elliptical nebulae, 3585 ; line profiles, 1906
Regener, V. H., atmospheric O$_3$, 3606
Rehaag, H., ordinal state of molecules, 461
Rehbinder, P., adsorption layers, 1493, 3556, 3557
Rehme, J., viscosity of suspensions, 3897
Reich, H. J., glow discharge tubes, 3344; time and speed measurements, 501 ; valve counting circuits, 3653
Reichardt, H., turbulence, 3083
Reichrudel, E., potential gradient in plasma, 1702
Reid, D. G., voltmeter, 3805
Reid, E. K., focalograph, 3032
Reiling, V. G., Čerenkov radiation, 4471
Reimann, A. L., evaporation from W, 3431 ; thermionic emission from C, 3039 ; work function of W, 384
Rein, N., 3-body problem, 1504, 3584
Reinders, W., fine grain developers, 2429 ; latent image, 3690
Reinhard, M. C., Ra dosage, 3867 ; short distance therapy, 1749 ; X-ray distribution, 3412
Reinhold, H., conductivity of Cu-Se alloys, 308
Reinicke, R., crystal models, 4293
Reinsberg, C., nuclear transitions, 1568, 4887
Reissner, H., compression waves, 1814
Reitz, A. W., Raman lines of pyrrol, furane and thiophene, 727 ; Raman spectra of cyclo-pentane derivatives, 1219
Renaud, A., snow halo, 3176

Renaud, P., chemical inertia, 773; vapour jet, 1444
Rencker, E., annealing of glass, 1172; expansion of glass, 1171
Renfrew, M. M., apparatus for Raman effect, 4560
Renninger, M., X-ray spectrometer, 2923
Reuter, H., resistance of Pt., 306
Reuther, R., colour photography, 1616
Reyerson, L. H., sorption of Cl_2 by C, 3109
Reynolds, D. A., structure of $Zn(SbO_3)_2$, 31
Reynolds, J. H., extra-galactic nebulæ, 1890
Reynolds, L., structure of human bone, 1408
Reynolds, P. W., lattice constant of Ag, 3466
Reynolds, R., kineradiography, 4252
Riabouchinsky, D., Eulerian and Lagrangian variables, 1426; fluid motion, 1427; supersonic waves in gases, 801
Ribaud, G., combustion temperatures and pressures, 785; flame propagation, 3312; flame temperatures, 767; forced convection, 3302; micrometer, 4787
Ribner, H. S., characteristic temperature of MgO, 3288
Ricamo, R., oscillations of flash discharge, 4623
Ricard, R., Cs spark spectra, 688, 2451
Rice, O. K., solid-liquid argon equilibrium, 3781; theory of fusion, 3783
Richards, D. A., high-vacuum camera, 179
Richards, W. T., supersonics, 2957
Richardson, E. G., sound, 1264; supersonic absorption in smokes, 1259; supersonics and molecular constitution, 1261
Richardson, J. R., artificial radioactivity, 1114; cloud chambers, 2837; disintegration of deuteron, 1117
Richardson, L. F., osglim lamp, 291
Richardson, O. W., H_2 spectrum, 1207, 4545
Richardson, R. S., ionosphere, 371
Richter, B., photographic emulsions, 662
Richter, C. F., earth's core, 2378
Richter, G., magnetic after-effect, 4701
Richter, M., colorimetry, 1131, 2412
Richtmyer, F. K., X-ray satellites, 241
Ricoux, A., Th α-particles, 147
Rideal, E. K., adsorption of gases, 987; intermolecular forces, 487, 1484; monolayers, 3982
Ridley, P., atomic vibrations in Mg, 3907; lattice-distortion in Rh, 2673; X-ray scattering, 239
Riedel, W., air adsorbed on drops, 2296
Riedinger, A., free rotation, 2572
Riedl, J., natural H-rays, 4893
Riedmiller, R., effusion-meter jet, 959; pressure multiplier, 958
Rieger, E., heat conduction in gases, 2068
Rieke, F. F., kinetics of OH radicals, 3726
Riesenfeld, E. H., diffusion of gaseous mixtures, 3494
Riewe, K. H., thermodynamics of ionisation, 806
Rigden, P. J., viscosity of air, O_2 and N_2, 3565
Ritschl, R., Al spark line, 2669.2Å, 2023; H canal rays, 3735, 3736; Hα line in electric field, 226; nuclear moment of Al, 2886
Rivin, M., detonation of hydrocarbon-air mixtures, 1246; explosive limits, 771
Rix, W., strength of glass, 4779
Roach, F. E., Eros, 4388
Roberts, J. E., Ra dosage, 5072
Roberts, J. K., adsorbed films, 3546, 4815; heats of adsorption, 4817, 4818
Roberts, R. B., production of N^{13}, 1573; transmutation of Li, 4889
Robertson, H. P., luminosity of receding nebula, 1028
Robertson, J. K., optical resolution, 4567
Robertson, J. M., interatomic distance, 1374; molecular structure, 908; resorcinol, 3061; structure of dibenzyl series, 937
Robertson, R. M., copper arc, 2111
Robinson, A. L., thermal data of $CdSO_4$, 3309
Robinson, H. R., electronic charge, 1305
Robinson, N. W., acoustical conductivity, 2955
Robinson, R. A., activity coefficient of $CoCl_2$, 4178
Rocard, Y., hearing during noise, 4614; valve oscillator, 4258
Rochester, G. D., AgCl spectrum, 216; PbF, spectrum, 4139; SnF spectrum, 215
Rochow, E. G., electrical conduction in quartz, 4643
Rock, G. D., sound field of quartz disc, 3792
Rodebush, W. H., absorption bands of hydrogels, 706; association and complex formation, 4956, 4957; association in carboxylic acids, 4530; infra-red spectrum of water, 1194
Rodionov, S., solar spectrum, 3602
Roebuck, J. R., Joule-Thomson coefficients, 1684, 2085
Röder, H., infra-red technique, 4561
Röder, H. L., dilatancy, 917
Rösch, S., dichroic sheet polarisers, 2876
Roeser, W. F., thermocouples, 2643
Rössler, F., Hg arc, 4513; spectral energy, 4518

Rogers, F. T., Jr., energy-range relations for particles, 2594 ; magnetic spectrograph, 296
Rogers, M. M., energy-range relations for particles, 2594
Rogovin, S., highly-polymerised solutions, 3108
Rogozinski, A., ionisation chamber, 1965
Rohde, H., crystallographic radii, 4754
Rohloff, E., internal friction of wood, 3984
Roich, I. L., black-body radiation, 2418
Roig, J., interference fringes, 4095, 4915
Rojansky, J., electron orbits, 2709
Rokhlin, G.. Hg discharge radiation, 4075
Roland, P., radiography of sections, 4703
Rolla, M., pyrrol, thiophene and furane spectra, 4523
Rollefson, G. K., photochemistry, 3679, 4485, 4918
Romanowski, M., potentiometer, 2131
Rompe, R., Hg discharge, 2458, 4512 ; positive column, 2118
Rona, E., α-rays from MsTh2, 4892
Ronchi, V., retinal resolving power, 1225 ; telescope images, 4508
Rood, P., solar spectrum, 541
van Roojen, J., radiating surfaces, 363
Rooney, W. J., earth currents, 3191
Roose, H., wall temperature, 3768
Roper, E. E., freezing point of MeOH, 3767 ; ice-point, 2506
Rosa, G., radioactive elements in air, 554
Roscoe, R., electron scattering by H_2, 3387
Rose, D. C., air conductivity, 3628
Rose, F., photographic emulsions, 661
Rose, F. W., Jr., spectral analysis of hydrocarbons, 1180
Rose, M. E., cyclotron, 1963, 2393 ; electron scattering, 2597
Rosemann, J., hue-difference sensitivity, 4070
Rosen, B., predissociation of S., 4955
Rosen, N., plane polarised waves, 477
Rosenbaum, E. J., excited state of LiH, 720
Rosenblatt, A., gravitation, 1817
Rosenblum, C., photolysis of acetone, 1612
Rosenbohm, E., allotropy of Nd, 1380 ; expansion of metals, 2930
Rosenhead, L., electroosmosis, 24
Ross, P. A., neutron absorption in Co, 337
Rosseland, S., light absorption in space, 1905
Rossi, B., cosmic rays, 2851
Rossi, C., viscosity of vaseline, 2217 ; voltaic e.m.f., 2611
Rossier, P., Nova Lacertæ, 111
Rossini, F. D., heats of formation, 4989
Rossiter, R. A., southern double stars, 4402
Rossner, W., molecular heat of vapours, 2494
Rostagni, A., ionisation and discharge cross-sections, 3382 ; ionisation of gases, 2549 ; positive rays, 3802, 4201
Rotblat, J., γ-ray absorption, 613
Roth, W. A., heat of solution of $AlCl_3$, 3772 ; specific heat of water, 4977
Rothé, E., earthquakes, 573 ; seismograph, 1942
Rothen, A., rotatory dispersion, 187, 188
Rothschild, S., ZnS spectra, 1215
Rottgardt, J., contact potential, 3392,
Rouard, P., Pt films, 2441, 4502
Rouault, M., structure of $GeBr_4$, 904 ; structure of PCl_5, 4738
Roubaud-Valette, J., field theory, 3394 ; mass and gravitation, 3100 ; "sub-spaces," 468, 1464
Rougerie, P., earth currents, 585
Roulston, K. I., sputtering of Mg in O_2, 5028
Rouppert, S., Se_2 spectrum, 1201
Rouse, A. G., scattering of K ions, 821
Rousset, A., molecular diffusion of light, 3675 ; Raman effect in gases, 1661
Rouvillois, J., transformation of band to continuous spectra, 3271
Rovner, L., Ra dosage, 3866
Rowe, H., magnetometer, 1567
Rowland, E. N., shot effect, 3520
le Roy, D. J., transference numbers, 3376
Roy, M. F., association and complex formation, 4956, 4957 ; association in carboxylic acids, 4530
Royds, T., solar eclipse, 112
Royer, L., parallel growths, 941
Rschevkin, S. N., acoustic luminescence, 167 ; piezo-quartz radiator, 279 ; reflection of h.f. sound, 4609
Rshevkin, S., wave phenomena in models 2532
Ruark, A., heavy β-particles, 1962
Rudé, G. T., marine surveying, 3166
Ruderman, E., adsorption theory, 3967
Rudisill, H., effect of X-rays on cells, 4707
Rudnick, J., night sky, 3620
Rudnick, P., μ^1 Scorpii, 2773 ; night sky, 515
Rüdiger, O., electron diffraction by crystals, 418 ; structure of metal films, 82
Ruedy, R., critical density, 3316
Rühle, H., micrometer eyepiece, 4332
Rühmkorf, H. A., Hg line 2537 Å, 4516
Rülke, O., seismic-electric effect, 3180
Ruge, A. C., earthquake accelerometers, 1560 ; pendulum control, 1495
Ruhemann, M., distillation, 268 ; H_2-N_2-CO system, 789
Ruhlig, A. J., electron absorption, 2156
Rule, J. T., stereoscopic drawings, 4569

Rumbaugh, L. H., transmutation of Li, 4889
Rumer, G., electronic showers, 2424
Rump, W., a.c. instrument calibration, 2108
Rumpf, K., luminescence of P, 1603
Rumpf, P., free radical of new type, 2171
Runnicles, D. F., diffusion of KCl in water, 4772 ; paraffin-chain micelles, 4773
Rushbrooke, G. S., binary liquid mixtures, 2291 ; cooperative phenomena, 3544
Rusinov, L., neutron absorption, 864, 1312
Ruska, E., electron microscope, 2606, 2607, 4231
Ruska, H., electron microscope, 2607
Russell, H. N., stellar atmospheres, 1522; stellar parallaxes, 2760
Russell, J., photo-cell circuit with logarithmic response 1352
Rutgers, A. J., Coehn-Raydt law of charge, 875 ; surface conductivity, 4636
Ruthardt, K., metal films, 4369
Ruud, I., tectonic problems, 1544
Ryan, J. J., photoelasticity, 2259
Rybalko, F., recrystallisation, 1795
Rybner, J., seismograph, 575
Ryde, J. W., luminescent materials, 4093
Ryde, N., Stark effect, 2906
van Rysselberghe, P., diffusion of electrolytes, 4770
Rytov, S. M., wave optics, 3699

Sabine, P. E., sound transmission, 5014
Sachs, R. G., neutron-proton interaction, 3384
Sack, H., molecular association, 2655
Sadron, C., Maxwell effect, 911, 4745, 4746
Sage, B. H., heat capacities of hydrocarbons, 243 ; viscosity of propane, 3567
Saha, N. K., disintegration of F, 4885
Saint-Genies, J. de L., fluted films, 3235
Saito, N., viscometer, 95
Sakata, S., elementary particles, 1306, 3000
Saksena, B. D., Raman spectra of bicyclic compounds, 4551
Sakurada, I., thread molecules, 1496 ; viscometer, 95 ; viscosity of high polymers, 1772
Sakurai, T., Heaviside operator, 3084 ; operational method, 1449
Sălăgeanu, N., thermoregulator, 2076
Salceanu, C., acoustic resonance in liquids, 798, 1693, 1694 ; magnetically neutral solutions, 2175
Salcewicz, J., heat produced in lead by own weight, 2498
Salter, C., anemometer, 3938 ; turbulence, 1433
Sambursky, S., static universe, 1018
Samis, C. S., transport numbers of paraffin-chain salts, 5045
Sammt, A., e.m.f.s between glass and salts, 324
Sampson, J. B., energy levels of Ne and A, 205
Sampson, M. B., r.f. voltage of cyclotron, 3352
Samuel, R., polyatomic molecules, 1765 ; semipolar double bond, 401 ; SiCl$_2$ and SnCl$_2$ bands, 2897
Sandbo, A., atomic distances in molecules, 4279
Sandhagen, M., secondary emission, 5057
Sanford, R. F., interstellar lines, 1517 ; stellar radial velocities, 2761
Sanigar, E. B., gelatin, 2222
Sanner, V. H., vacuum sparks, 2119
Sano, K., electrolysis of MgCl$_2$, 3375
Sano, T., cup-anemometer, 2803
Sappa, O., ferromagnetic powders, 878
Sarinsky, W., H$_2$ overvoltage, 850
Saris, B. F., heat conduction in liquid HeII, 2070
Sasaki, N., atomic rays, 3940
Sasaki, T., foam, 4368 ; oiliness, 1872
Sasvári, K., structure of AgMnO$_4$, 2240
Sata, N., effect of h.f. sound on colloids, 27, 415
Satô, K., resonator in sound field, 2964, 3337
Satô, M., Brownian motion, 3518, valency electrons, 4292 ; X-ray absorption, 1668
Satoh, S., nitrides, 1678, 1679, 2496, 2943, 3311, 3774, 4163, 4587 ; thermal data of Al$_4$C$_3$, 1677
Satterly, J., liquid jet, 1436
Sauer, E., wetting of pigments, 1860
Saunders, F. A., violins, 276
Saunders, O. A., fluid heated from below, 2072
Saur, E., alkali halogen lattices, 2676
de Saussure, R., Euclidean space, 4343
Savard, J., critical potentials of CO, 2547, 3801
Saveliev, V., diamagnetic cyclic molecules, 881
Savitch, P., radioelement formed from U, 2386, 3193
Savur, S. R., probability, 4790
Saweris, Z., adsorption on mica, 1859
Sawyer, H. B., bright Nova of 1860, 1532
Sawyer, R. A., nuclear moment of Ba, 224 ; Sn II spectrum, 3242 ; solar spectrum, 541
Saxl, E. J., elasticity of gelatins and fibres, 1384
Saxton, H. L., sound propagation in gases, 796
Sayer, A. R., Nova Ophiuchi, 1054
Sayers, J., negative ions in discharge tubes, 2112
Saylor, C. P., freezing of rubber, 4290
Saylor, J. H., Henry's law, 1691

Scarpa, O., voltaic e.m.f., 2516, 2611, 3391
Scarre, O. C., isotopic constitution of water, 395
Scatchard, G, vapour-liquid equilibrium, 3788
Schaacke, I., twin formation, 433, 940
Schade, R., discharges in rare gases, 810, 2120
Schaefer, C., Brownian motion, 2274 ; dispersion, 4507
Schäfer, K., vibrations of ethane, 4126 ; X-ray analysis, 2921
Schaefer, V. J., insoluble monolayers, 86
Schaeffer, W., radio-As, 3194
Schätzler, F., retention of vapours by gels, 3968
Schaitberger, G., colour centres in KCl and NaCl, 38
Schalén, C., meteor spectrum, 1011
Schardin, H., spark photography, 667
Schaub, W. R., rotating beacons, 3746
Scheffers, H., conductivity of Pb in magnetic fields, 4233 ; conductivity of W, 305 ; resistance of Al crystals, 1732
Scheibe, A., Schuler clock, 4828
Scheibe, G., polymerisation of dyestuffs, 1206
Scherrer, W., causality principle, 476 ; principles of physics, 2289
Scherzer, O., Doppler effect, 2915
Schicktanz, S. T., rectifying columns, 271
Schiff, L. I., β-ray absorption, 2832 ; nuclear systems, 1761
Schiffer, M., static universe, 1018
Schilling, H. K., sound diffraction, 5018
Schintlmeister, J., existence of Th-Po, 4882 ; ionisation chamber, 4068 ; range of α-rays, 1118, 1119, 1120
Schive, J., transit observations, 3125
Schlecht, H., binary alloys, 3809
Schlechtweg, H., crystals in magnetic field, 3400
Schlesinger, F., longitude, 1507
Schlessinger, L., photodecomposition of CH_3I, 2427
Schloemann, E., photographic developers, 172
Schlötzer, elastic after-effect, 3503
Schlomka, T., earth's angular momentum, 4880
Schlosser, E. O., h.f. multiple acceleration, 3803, 4065
Schmeiser, K., cosmic rays, 593, 2423, 4480
Schmerber, C., angle measurement, 4336
Schmerwitz, G., damping coupling, 5077
Schmid, G., colloidal electrolytes, 312, 4641
Schmid, R., CO spectrum, 3269 ; dissociation energy of CN, 1649 ; energy states of diatomic molecules, 4546
Schmidlin, H., earth's demagnetising action, 1107
Schmidt, A., polarograph, 4666
Schmidt, G., liquid He temperatures, 252 ; thermo-molecular pressure, 1438, 1440
Schmidt, R., depolarisation of gases, 4104
Schmidt, R. J., fluid heated from below, 2072
Schmidt, T., nuclear moments, 2027
Schmitt, F. O., living systems, 1783 ; structure of tissues, 32
Schmitt, O. H., galvanometer characteristics, 3354 ; valve voltmeter, 2128
Schmitz, H., X-ray protection 890
Schmolke, H., Nernst heat law, 1681
Schmutzer, J., sugar crystals, 432
Schneider, E. G., cosmic rays, 1989 ; secondary emission of Be, 3838
Schnirman, G. L., seismograph, 1561
Schöfer, R., Townsend factor γ, 4193
Schoen, E., magnetisation of Fe, 351
Schön, M., positive column, 2118
Schoenberg, E., interstellar space, 2776
Schönberg, M., Dirac's function δ (x), 63 ; field theory, 3095
Schoeneck, H., supraconductivity, 304
Schöntag, A., fluorescence of methyl acridone, 2862
Schofield, R. K., viscosity of liquids, 90
Schonland, B. F. J., lightning, 132, 2383
Schoon, T., long-chain hydrocarbons, 2683 ; surface structure, 3552
Schossberger, F., X-ray camera, 436
Schoszberger, F., structure of cellulose, 2225 ; structure of rubber, 1390
Schottky, W., thermionic emission, 1361
Schremp, E. J., cosmic rays, 3665, 3666
Schreuer, E., diffraction of light by h.f. sound, 277 ; supersonic interference, 278
Schröder, E., heat capacity of fluorides, 4980
Schrödinger, E., wave function, 2714
Schröer, E., detection of S compounds, 4510
Schubert, M. P., duroquinone system, 3852
Schuchowitzky, A., adsorption theory, 3115
Schuck, O. H., standard tuning fork, 4618
Schüler, H., rotational states, 2467
Schürenberg, H., atomic resistance of Pb alloys, 4638
Schüttlöffel, E., radioactive decay, 134
Schütze, W., canal rays, 2974 ; mass spectrograph, 4
Schuler, M., Schuler clock, 3560
Schulman, J. H., monolayers, 2738, 4774
Schultz, H. L., disintegration of deuteron, 1956 ; neutron emission, 1572
Schultze, G. R., discharge in hydrocarbons, 2553

Schulz, G., densities of solutions, 3488
Schulz, G. V., heats of dilution, 3921
Schulz, H., achromatic lenses, 4929; focal lengths, 1629; mirror systems, 677; spherical aberration, 2880; telescope, 4928
Schulz, P., Hg discharge, 2458, 4512; width of spectral lines, 2885
Schulz, R. W., electric moments of NO_2 and N_2O_4, 3819
Schulze, A., melting point of Si, 247; Mn ferrites, 2562, 2563; resistance material, 2978
Schulze, G. E. R., diamagnetic salts, 3850
Schulze, H., magnetic after-effects, 3016
Schulze, R., air equivalent of γ-radiation, 148; Eve constant, 2401
Schumacher, H. J., $COCl_2$ formation, 2868
Schumann, S. C., entropy of acetone, 3785; entropy of alcohol, 3784
Schumann, T. E. W., hailstone formation, 1090; rainfall, 3618
Schumb, W. C., ferric-ferrous electrode, 328
Schur, J., magnetic hysteresis, 1324
Schwarz, K., high energy electrons, 2998; velocity of ions, 4663
Schwarzenbach, G., normal potential of D_2, 2587
Schwarzschild, M., Cepheids, 4007; stellar pulsations, 1045
Schweickert, H., Se photo-cells, 3425
Schwerin, K., densitometer, 2005
Schwindt, H., dielectric loss, 2577
Ścisłowski, W., electric currents in wax, 2983
Sconzo, P., continental drift, 1931
Scott, R. B., supraconductors, 1284
Scrase, F. J., electricity on rain, 2810
Scribner, B. F., Yb spectra, 199
Seaborg, G. T. distribution between phases, 4814; Fe isotopes, 3195; neutron scattering, 3007; radioactive, Mn, 4451; radioactivity test for impurities, 4059
Seares, F. H., stellar magnitudes, 1030, 1898, 1899
Seaton, S. L., ionosphere, 2192
Seddon, E., resistivity of glasses, 3363
Seddon, R. V., $N_2O_5+O_3$ flame, 2946
Sedgwick, F. P., thermostromuhr, 1746
Sedlmayr, K., simultaneous recording by Braun tube, 2609
Sedov, L., hydrodynamical theory of lattices, 1429
Seeder, W. A., viscosity of liquids, 92
Seeger, R. J., electrical breakdown in crystals, 4656
Seeliger, R., electrophysics of gases, 2557; positive column, 4622
Seemann, H. E., intensifying screens, 888; secondary radiation intensity, 2637
Segal, I. E., probability, 965
Seiberlich, J., viscosity of starch paste, 4832
Seidel, A., spectra of Pr salts, 4539
Seidel, H., conductivity of Cu-Se alloys, 308
Seidl, F., charging current in Rochelle-salt, 5081
Seifen, N., velocity of h.f. sound in liquids, 2962
Seifert, H., $KClO_3$-$KMnO_4$ system, 1796
Seifert, W., sensitometry, 1614
Seiler, K., vacuum seal, 4346
Seiler, M., strength of acids, 330
Seith, W., vapour pressure of Zn in brass, 795
Seitz, F., phosphors, 1991, 3668
Sekiguchi, Y., $BaSO_4$ suspensions, 4286
Selényi, P., wide-angle interference, 1994
Seligmann, P., heat contents of salt solutions, 4986
Seltz, H., Cd-Sb system, 3319
Selwyn, E. W. H., colour charts in photography, 1585; colour of photographic subjects, 1584; optical bench, 4932; probability paper, 4337
Šemiakin, F. M., soil freezing, 1542
Sen, B., stress equations, 3499
Sen, B. M., nuclear structure, 1367
Sen, D. N., ash particles in air, 2666; vibrating string, 4605
Sen, N. R., expansion of a nebula 2323; polytropes, 4397
Sen, S. N., cyclones, 2359
Senda, K., upper air temperature, 4427
Senftleben, H., heat conductivity of gases, 244; viscosity of gases, 502
Sen Gupta, A. K., SnO spectrum, 3257
Sengupta, M., semiconductors in magnetic fields, 876
Sengupta, S. B., conductivity of fluorescent solution, 4549
Senkus, M., O_3 tube, 1273
Serber, R., $B^{11}+H^1$ reactions, 1958; cosmic rays, 4086
Serres, A., paramagnetism of Mn, 5059
Servant, R., magnetic field measurement 2625; rotatory power of quartz, 4105
Serville, R., hydraulic régime, 3515
Seth, B. R., waves in canals, 1820
Severny, A. B., Compton scattering in stars, 3594; degenerate gas, 66
Sevin, É., mass-luminosity relation, 103; stellar atmospheres, 3151; stellar energy, 104
Sewig, R. H., spectrophotometers, 3740
Seyer, W. F., decahydronaphthalene, 4580; freezing point of dicetyl, 2504
Seyfert, C. K., galaxies, 1024, 1025
Sezawa, K., cooling of earth, 4027, 4028, 4854; planets, 2758; Rayleigh waves, 1097, 2804, 4048; seismic waves, 3267, 4875, 4876; stability of earth, 1098, 1099; tidal waves, 1077
Shapiro, C. S., thermodynamic properties, 2515

Shapley, H., galaxies, 1023, 1912, 3135, 3991 ; eclipsing binaries, 4008 ; expanding universe, 1888 ; 44i Bootis B, 1919 ; metagalactic density- gradient, 3993 ; photometry of stars and clusters, 1525 ; stellar system, 2342 ; variable stars, 1057
Sharan, S., resistance of ferromagnetics, 3843
Share, S. S., H^3 and He^4 nuclei, 2887
Sharma, J. L., hypergeometric function, 1452
Sharpley, B. F., evaporation of water, 4600
Shaw, A. E., determination of e/m, 4223
Shearin, P. E., infra-red wave-lengths, 1635
Shedlovsky, T., ionisation constants, 3360 ; pH scale, 2993
Shepherd, W. G., disintegration of Be, 140
Shepherd, W. M., finite strain, 4775
Sherman, K L., air potentials, 128 ; atmospheric electricity, 577
Sherr, R., isotopes, 2208
Sherrill, M. S., ferric-ferrous electrode, 328
Sherwin, C. W., sound absorption, 2537
Shewhart, W. A., statistical methods, 3535
Shiba, H., rotatory dispersion of sugars, 2011
Shiota, R., fineness of powder, 3942
Shirai, S., structures of ion films, 81
Shiratori, A., hydrophilic properties of cellulose, 3450
Shire, E. S., thermal equilibrium below 1° Abs., 2507
Shirley, E. G., elliptical nebulæ, 3585
Shirshov, P., North Polar station, 2352
Shishacow, N. A., two-dimensional silica crystals, 425
Shishlovsky, A. A., u.v. energy distribution, 693
Shlaer, S., adaptometer, 3285 ; spectrophotometer, 732 ; visual acuity, 742
Shockley, W., Cu-Au alloy system, 1396; induction of moving point charge, 4699 ; interaction of atoms in alloys, 3908 ; order-disorder in alloys, 1788
Shonka, F. R., counter circuits, 2406
Shortley, G. H., Cu II and rare gas configurations, 4941 ; Laplace's equation, 2703 ; theory of complex spectra, 4940
Shotter, G. F., electrical instruments, 1290
Shoulejkin, W. W., drift of ice-fields, 4020; monsoons, 120, 1547
Showalter, A. K., frontal movements, 4856
Shrader, J. E., phonodeik, 5019
Shrider, A. L., heterochromatic photometry, 3693
Shroedinger, E., Eddington's world-theory, 4348
Shulvas-Sorokin, R. D., relaxation in Rochelle salt, 2197
Shute, H. L., surface tension of paraffin chain salts, 2736
Shutt, W. J., dielectric constants of zwitterions, 1718 ; dielectric properties of salt solutions, 1717 ; polar solvents, 4351
Sibata, T., spinor calculus, 4804 ; wave geometry, 1839, 4805, 4807
Siddiqi, M. R., differential equations, 3085
Sidei, T., absorption spectra and H-bridges, 2892
Sidhu, S. S., acetysalicylic acid, 3757 ; filter for Kα Cr radiation, 748 ; spacing of crystal systems, 416
Sidorof, S., Ni-Zn alloys, 4247
Siebert, H., Hg drop electrode, 1303, 3379
Siedentopf, H., gratings, 1996 ; Hagen's clouds, 99
Siedentopf, H. F. W., gratings, 2865
Siegbahn, M., X-ray spectrum, 3289
Siegel, S., elastic constants of Na, 3500; expansion of Na, 3304
Sieverts, A., solubility of D_2 and H_2 in Pd, 71 ; solubility of gases in Fe, 4812 ; susceptibility of D_2-charged Pd, 307
Sihvonen, V., graphite electrode, 4665
Siksna, R., Li I, spectrum, 2457
Silberman, T. I., linear adsorption, 3114; two-dimensional colloids, 1381
Silberstein, A., structure of bromo-cupric compounds, 2680 ; structure of $CuCl_4 \cdot 2NH_3 \cdot (NH_4)_2$, 3476
Silberstein, L., colour domain, 1969 ; probability, 3521
Sillén, L. G., structure of Bi_2O_3, 3475
Silsbee, F. B., supraconductors, 1284
da Silva, A. M., materialisation of photon, 2844
Simeon, F., physical-optical instruments, 1175
Simmons, L. F. G., turbulence, 1433
Simms, H. A., noise aboard ship, 4615
Simon, F., third law of thermodynamics, 783
Simon, G., thermoelectric power of Fe-Ni alloys, 899, 2201
Simonoff, M., units, 4338
Simons, C. F. E., u.v. absorption of Au and Ag, 3207
Simons, H. D., X-rays from radio valves, 745
Simpson, D. M., absorption spectra of SO_2 and CS_2, 2041 ; dispersion, 189
Simpson, G. C., aurora, 2371 ; ice ages, 3175 ; ice on aircraft, 1089
Sinden, R. H., ideal colour system, 4465
Singer, G., X-ray intensity, 3756
Singh, B. N., refractive index of ionised air, 3875 ; stellar constitution, 1910, 3593
Sinha, K. L., structure of benzil, 1406
Sinn, V., lead accumulator, 3373

Sirkar, S. C., heat-capacities of crystals, 3293 ; intensities of Raman lines, 726 ; origin of Raman lines, 2909 ; Raman spectra of mixed crystals, 1660
Sirotkin, B., diffusion of metals, 440
Sitte, K., diffusion of electrolytes, 3920 ; liquid crystals, 2245
Sittkus, A., cosmic rays, 1979
Sizoo, G. J., absorption of Ra γ-rays, 1582 ; γ-ray counter, 1129 ; Rn content of tap-water, 1948
Sjöstedt, G., diffusion of water in glycerin, 4315
Skaggs, L. S., disintegration of Be, 3642
Skan, S. W., differential equations, 2277
Skellett, A. M., time lag in photo-cells, 4729
Skinner, H. W. B., soft X-ray bands from dilute alloys, 749
Sklar, A. L., excited levels of benzene, 4547
Skwara, M., Al-Cu alloys, 4581
Slack, F. G., optical activity of $NiSO_4$, α-$6H_2O$., 4074, 4107
Slätis, H., Lecher wire measurements, 4620
Slater, J. C., electrodynamics, 1470 ; energy levels in crystals, 3905
Slater, N. B., reaction kinetics, 786
Slavin, M., spectrum analysis, 4114
Slawsky, M. M., Geiger-Müller counters, 614
Sljusarev, G., large aperture spectrographs, 731
Sloane, R. H., negative-ion formation, 4629
Slocum, G., sea-water temperature, 3164
Sluckaia, M. M., isotopic constitution of water, 395
Slutzkin, A., electron temperature, 345
Smart, W. M., star-streams, 3145 ; stellar radial velocities, 3588
Smekal, A., elastic limits, 1806
Smiley, C. H., Schmidt cameras, 2006
Smit, J. A., cross-section of He atoms, 4331
Smith A. W., e.m.f. measurement, 4632 ; PbSe, SnSe and PbTe spectra, 714
Smith, C., decomposition of NH_3 by α-rays, 1960
Smith, C. E., opposition of Eros, 518
Smith, C. L., α-particles from ^{8}Li, 2827 ; transmutation of F, 4455
Smith, E. R., Ag-AgCl electrode, 2994 ; boiling points of hydrocarbons, 2520 ; water as ebulliometric standard, 2093
Smith, H. G., sound velocity in He, 4606; supraconductors, 1712, 5032, 5033
Smith, H. P., X-ray activated water, 2919
Smith, J. W., wave mechanics, 1463
Smith, K. U., visual acuity, 743
Smith, L. P., electron scattering, 2597
Smith, N. D., H_2 spectrum, 1213
Smith, N. M., Jr., disintegration of Be, 3642 ; scaling circuit, 2836
Smith, R. A., negative-ion formation, 4627
Smith, R. L., properties of hydrocarbon mixtures, 788
Smith, T., optical instruments, 4967
Smith, W. F., photographic emulsions, 3682 ; photographic gelatin, 3681
Smith, W. H., freezing of rubber, 4290
Smith, W. V., entropies of ions, 4175
Smithells, C. J., gases and metals, 3969
Smits, A., complexity of Al_2Cl_6, 4282 ; complexity of P_2O_5, 4281 ; formation of new phases, 2086 ; transformation of ND_4Br, 4309
Smittenberg, J., freezing points of hydrocarbons, 1241
Smyth, C. P., covalent bonds, 1291 ; molecular rotation, 2987
Snell, A. H., Br isotopes, 139
Snoddy, L. B., lightning, 1563
Snoek, J. L., magnetisation, 4237
Snyder, H., cosmic rays, 3213
Socher, H., latent image, 1615
Soderstrom, G. F., human body temperature, 254
Söllner, K., colloidal dispersion by h.f. sound, 4181
Sokob, P., compensator, 4499
Sokolik, A., detonation of hydrocarbon-air mixtures, 1246 ; explosive limits, 771
Sokolow, A., neutrino theory of light, 2415 ; radiation from electron-pairs, 627 ; theory of showers, 4472
Solf, K., diffusion syphon, 2253
Soller, T., manostat, 2722
Sollers, E. F., dissociation pressures of NaD and NaH, 792
Solomon, J., artificial disintegrations, 599 ; neutrino, 629, 4906 ; quantum mechanics, 467 ; Stefan's law, 3210
Soltan, A., radio-Si, 4058
Someno, F., absorption spectra and molecular structure, 4531
Somerville, J. M., differential equations, 3086 ; electric wave propagation, 5076
Sominski, M. S., semiconductors, 3814
Sommer, J. J., turbulence, 1432, 2700
Sommer, P., centrifuge, 3456
Sommerfeld, A., Kepler problem, 2715 ; planets, 2757
Sommerfeldt, A. M., structure of cyclohexane, 4303
Sommermeyer, K., quantum processes of radiobiology, 3868
Somville, O., seismograph, 1940
Sona, L., vortices, 3077
Sookne, A. M., elasticity of wool, 20 ; ozaphane films, 4490
Soremba, K. H., structure of paraffins, 4762
Sosnowski, L., slow neutrons, 2603

Soubarew-Chatelain, Z., absorption spectra of MoO_3-NaOH systems, 2039
Souders, M., Jr., viscosity and constitution, 999
Southwell, R. V., conical shells, 45; fluid motion along tube, 4783; relaxation methods, 946, 4776
Špakovskij, B. G., dispersion of h.f. sound in liquids, 1695
Spangenberg, K., crystal growth, 4767
Sparks, C. M., absolute ohm, 5031
Spees, A. H., specific charge of β-particles, 2591; variation of electron mass, 2592
Spencer, D. A., colour filters, 3225; colour photography, 2003
Spencer-Gregory, H., thermal conductivity of H_2, 1236
Spicer, B. A., electroscope, 4685
Spiers, F. W., X-ray scattering, 238
Spitzer, L., Jr., equation of radiative transfer, 524
Spivak, G., potential gradient in plasma, 1702
Spivak, P., electron pairs, 4460
Spotnitz, H., dark adaptation, 234
Springall, H. D., structures of PMe_3 and $AsMe_3$, 2653
Spychalski, R., colloidal Ag, 2657
Squire, C. F., Cotton-Mouton effect, 1970; diamagnetic anisotropy, 2172; susceptibility of MnO, 4694
Squire, G. V. V., photochemical union of H_2 and Cl_2, 1156
Squires, L., viscosity of emulsions, 1387
Sreenivasaiah, B. N., dust storms, 564
Srinivasan, M. K., viscosity of electrolytes, 3983
Sriraman, S., diamagnetism of Cd, 3025; susceptibilities of complex ions, 353
Srivastava, B. N., effusion, 3962; ionisation equilibrium, 3961
Staats, E. M., monochromatic filters, 2409
v. Stackelberg, M., Hg kathodes, 4222
Stainoff, S., electrolysis of Na_2SO_4, 4659
Stair, R., eye-protective glasses, 3745; u.v. solar intensities, 1079
Stamm, A. J., cellulose-water system, 18; water in wood, 1487
Stanford, S. C., thermodynamic data of hexyl alcohols, 2519
Stansfield, R. G., diffusion of H_2 through Pd, 442; magnetic field measurement, 5061
Stanton, H. E., ionosphere, 2192
Stark, J., canal rays, 203, 3735, 3736; Hα line in electric field, 226; pragmatism and dogmatism, 2720; reality, 1472; supraconductivity, 304
Starkey, T. V., liquid-prism spectrometer, 4152
Starr, C., heat conduction in metals, 3763
Starr, M. A., cosmic rays, 594, 637; electron velocities, 4225
Stasiw, O., alkali halogen lattices, 2676
Staub, H., D-D reaction, 2824
Staudinger, H., viscosity of polymers, 1383
Staunig, K., biophysical X-ray effect, 4708
Staverman, A. J., Van der Waals forces, 259
Steacie, E. W. R., decomposition of ethane, 1998, 4917; Hg resonance radiation, 4077
Stearns, J. C., cosmic rays, 1981, 3211, 4908
Steavenson, W. H., comets 1937 b, c, and f, 509; Novæ, 1937-1938, 3597
Stebbing, G. F., wave-length in radiotherapy, 2186
Stebbins, J., solar corona, 1926; stellar magnitudes, 1897
Steenbeck, M., gravity-free electric arc, 809
Stefănescu, D., $SOCl_2$ spectrum, 3711
Stefanescu, S. S., electromagnetic theory, 2165
Stehberger, K. H., electron rays, 872
Stehn, J. R., ground level of ^{7}Li, 2028
Stein, R., currents in dielectrics, 1722
Steiner, K., supraconductivity, 303, 304
Steiner, L. A., viscosity of aniline, 4831
Steingiser, S., magnetic rotation, 4905
Steinhardt, L. R., dielectric bolometer, 2859
Steinhaus, H., localisation by X-rays, 2922
Steinhaus, W., magnetisation of Fe, 351
Steinmaurer, R., cosmic rays, 1986, 4080, 4907
v. Steinwehr, H. E., α-β transformation in quartz, 3470
v. Steinwehr, H., current balance, 2976
Steller, J. P., low-temperature thermometers, 3308
Stenstrom, W., effect of radiation on oils, 4973
Stenzel, H., distortion of sound field, 2525
Stepanoff, V., stability-probability, 1458
Stepanow, A. W., strength of rock-salt, 435
Stepanowa, E. G., scattering of β-particles, 1124
Stephens, W. E., disintegration of N, 141; neutrons from Li, 1115; short ion-path h.v. tube, 1275
Stephenson, C. C., thermal data of SO_2, 3294
Stephenson, R. J., transmission of electrons, 3836
Stern, A., fluorescence of chlorins, 3667; spectra of pyrrol dyes, 3714
Sterne, T. E., δ Scuti, 1921; Epsilon Aurigae, 2343; long-period variables, 1058; radiometry, 2425

Stetson, H. T., seismic disturbances and moon, 571
Stetter, G., mass of neutron, 4669; scattering of Po α-particles, 1120
Steudel, R., photographic emulsions, 2001, 2431
Steurer, E., intermolecular forces, 2524
Stevels, J. M., carbon-halogen bond, 1375; refraction of methane derivatives, 1631
Stevens, G. W. W., photographic reversal, 3689
Stevens, W. R., cyclones, 3171
Stevenson, A. B., metal thickness tester, 2275
Stevenson, A. C., flexure of prisms, 3066; rotating rope, 948
Stevenson, A. F., normal state of He, 4123
Stevenson, D., structure of H_3, H_3^+, and of H_3^-, 12
Stevenson, D. P., dipole moments, 4645; structures of butane derivatives 1379; structures of ketene and thiophosphoryl chloride, 906; thermodynamic functions, 784
Stevenson, E. C., valve counting circuit, 299
Stewart, J. K., vibrations of plates and membranes, 3328
Stibitz, G. R., potentials in curved surfaces, 2610
Stierstadt, O., international short-wave congress, 364
Stille, U., active N., 3671
Stilwell, G. R., moving atomic clock, 3541
Stockbarger, D. C., KBr single crystals, 431
Stockmann, A., Caspian sea, 4021
Stockmann, L. L., cosmic rays, 642
Stoddard, L. G., Eros, 4388; u.v. stellar space, 526
Störmer, C., aurora, 2802; 4863
Størmer, R., heat flow, 2065
Stoicovici, E., fluorescence of calcites, 1147
Stone, R. S., skin reactions to X-rays, 1341
Stonehill, H. I., mean ionic diameters, 2150
Stoner, E. C., electron specific heat, 2948; electron spin paramagnetism, 1739; Fermi-Dirac functions, 980; ferromagnetism, 2167, 3013
Stoopnikov, N., solar spectrum, 3602
Storks, K. H., molecular layers, 2310; structure of polymers, 3886
Stosick, A. J., structure of As_4O_6, P_4O_6, P_4O_{10}, and $(CH_2)_6N_4$, 3888
Stout, B., vowel structure, 5015
Stout, J. W., adsorption of He, 1857; induction heaters, 2079; resistance-thermometer heaters, 2937
Stovall, E. J., photographic film shrinking, 180
Stoves, J. L., band-spectral constants, 4962
Stradelli, A., diagrams of state, 3778
Strain, C. V., induced radioactivity, 1951
Straley, J. W., PbSe, SnSe and PbTe spectra, 714
Stranathan, J. D., electric moments of MeOH and EtOH, 3818
Stranski, I. N., alkali halide crystals, 3485; crystal habit and intermolecular forces in homopolar crystals, 1411
Strassl, H., stellar spectra, 4396
Strassmann, F., disintegration of Th, 3640; trans-uranium series, 3639
Straumanis, M., crystal structure methods, 3916; lattice constants of Bi, Mg and Sn, 3911; lattice constants of LiCl and NaBr, 2675
Street, J. C., demonstrating radioactivity, 2402
Strelkov, P. G., Zeeman effect, 3274
Strijland, J., Curie point of Ni-Cu alloy, 356
Strömgren, B., ε-Aurigæ, 535; He and H content of stars, 2770
Strömme, L. C., molecular structure of $C(CH_2X)_4 \cdot (X=Cl$, Br or I), 935; structure of ZnI_2 and CdI_2, 1377
Strohl, A., nerve potentials, 5066
Strohmeier, W., δ Cephei, 1904, 3589
Struth, W., spark photography, 667
Strutt, M. J. O., a.c. measurements, 2129
Struve, O., ε-Aurigæ, 535, 3160; interstellar nebulosities, 4401; nebular spectrograph, 2749; outer shells of stars, 3150; spectrograph, 508; Stark effect, 1515
Stuart, H. A., ordinal state of molecules, 461
Stuart, N., metal trees in gels, 2995
Stuart, W. S., iron-cored circuits, 3015
Stubbe, H., radiation protection, 5070
Stuckey, J. M., Henry's law, 1691
Stueckelberg, E. C. G., heavy electrons, 3045; nuclear forces, 2710; nuclear theory, 3435
Stücklen, H., butene-2 and pentene-2 spectra, 213; u.v. absorption in hydrocarbons, 1210
Stuhlinger, E., cosmic rays, 1980
Stuhlman, O., Jr., auditory ossicles, 285
Stull, D. R., microcalorimeter, 756
Sturtevant, J. M., thermostat, 4584
Subbaramaiya, D. S., light diffraction by ripple, 1151
Subrahmanyam, D. S., sphere oscillating in liquid, 455
Sucksmith, W., paramagnetism of Co and Fe, 3856
Sueda, H., spectra of chromic salts, 711; spectra of complex salts, 3721
Suga, T., Hg I spectrum, 1638; N_2 spectra, 4137; Si spectrum, 198; u.v. spectra of H, He and Ne, 1637
Sugawara, N., vortices, 3929

Sugden, S., dipole moments of vapours, 829
Sugita, T., cosmic rays, 2420; infra-red photography, 668
Sugiura, T., Hg I spectrum, 1638
Suhner, F., magnetic rotation of HF, 4469
Suhrmann, R., electron emission, 4264; emission of Ba-coated Pt, 385
Sulaiman, S. M., new relativity, 2727
Sumoto, I., γ-ray activity induced in Cd, 2828
Sur, N. K., dust storms, 564
Surugue, J., β- and γ-radiation, 610
Sutcliffe, R. C., barometric pressure, 3612; tropical storms, 1086
Sutherland, G. B. B. M., CCl_4 spectrum, 1663; CH_2Cl_2 spectrum, 1648; inter-atomic distances, 907
Sutton, L. E., electric polarisation, 4650, 4652
Suzuki, S., exploded bodies, 4342
Svedberg, T., ultracentrifuge, 1785
Svensson, B., Stark effect, 225
Svešnikov, B. J., chemiluminescence, 2864; fluorescence of dye solutions, 649
Swan, G. A., spectra of pyridine derivatives, 4536
Swank, H. W., tristimulus values, 623
Swann, W. F., stellar magnitudes, 1032
Swann, W. F. G., atomic entities, 1473; Bartol Research Foundation, 4482
Swanson, C. E., transverse sound waves, 5006
Sway, B., Moseley law X-ray tube, 4572
Sweer, J., ray path in atmosphere, 4433
Sweet, M. H., density comparator, 4494
Sweetser, S. B., ferric-ferrous electrode, 328
Świętosławska-Ścisłowska, J., mobility of ions in dielectrics, 2990
Świętosławski, W., distillation, 267; heat produced in lead by own weight, 2498; water as ebulliometric standard, 2093
Swindells, N., specific heat of alloys, 4576
Swings, P., cometary spectra, 3987; radiative transfer, 4844
Swirles, B., wave functions, 1836
Swope, H., eclipsing binaries, 4008
Swope, H. H., variable star, 1061
Sykes, C., Cu_3Au alloy, 2672; specific heat of alloys, 4576; specific heat of Ni, 4164
Symms, L. S. T., micrometer, 1499
Synge, J. L., equilibrium of membrane, 1415; viscous flow between cylinders, 3513
Syôno, S., wave equation, 1830
Syrkin, J. K., vapour pressure, 1252
Szabó, Z., electrolytic thermo-cells, 2988; HCl galvanic cells, 838
Szarvas, P., Congo-dye sols, 3899
Szczeniowski, S., cosmic rays, 4082
v. Szentpály, N., microcalorimeter, 757
Szivessy, G., polarising plates, 3234, 4500
Szulc, M., MgD^+ spectrum, 4136

Ta, Y., Raman spectrum of HCl, 4550
Taboury, F. J., polished electrodes, 3826, 4218
Taconis, K. W., structure of liquid He, 1791; structure of solid He, 1403
Taft, R. B., lost radium, 4719
Tait, G. W. C., liquid jet, 1436
Takada, T., electrokinetic potential, 3052; lyophilic properties of nitrocellulose, 3449
Takahasi, K., earth's crust, 572; flow of granular mass, 551
Takahasi, T., wind vector, 2358
Takamine, T., N_2 spectra, 4137; Si spectrum, 198
Takayama, T., seismic waves, 4047
Takegami, T., effect of wind on sea surface, 4420
Takeno, H., field theory, 4797; wave geometry, 4808
Takesita, I., X-ray reflection by crystals, 4570
Taketani, M., elementary particles, 3000
Takeuchi, M., cosmic rays, 632
Takéuchi, T., cosmic rays, 2420; infra-red photography, 668
Talmud, B. A., adsorption of gases, 1855
Talmud, D. L., adsorption of gases, 1855; linear adsorption, 3114; two-dimensional colloids, 1381
Tamaki, H., neutrino-neutron collision, 630
Tamamushi, B., $BaSO_4$ suspensions, 4286; thixotropic systems, 1779
Tamm, I., cosmic rays, 4078
Tamura, Y., diurnal magnetic variations, 583, 1945
Tanabe, S., rotatory dispersion of sugars, 2011
Tanaka, K., electron diffraction patterns, 4367; oxidation of Al, 2306
Tanaka, M., production of X-rays, 1667
Tanaka, T., solar spectrum, 1534
Tanaka, Y., HgH and HgD spectra, 4135; N_2 spectra, 4137
Tandberg, J., intensity of radioactive source, 135
Tandon, A. N., electron affinity of iodine, 2233
Tanis, H. E., Jr., biological effects of X-rays, 4706; X-ray tube, 894
Tannahill, T. R., star-streams, 3145
Tarasov, L. P., texture measurements, 1789
Tardi, P., angle measurement, 4336
Taschek, R., liquid crystals, 3917
Tasiro, Y., cylinder moving in liquid, 1822
Tatel, H., neutron absorption in Co, 337; X-ray diffraction films, 942
Tawde, N. R., Swan bands, 715
Tayerle, M., focusing of X-rays, 237; resolving power in X-ray spectra, 750

Taylor, A., Fe-Ni-Al alloys, 2671
Taylor, A. C., silver-silver azide electrode, 1726
Taylor, A. H., W, Hg and Na illuminants, 4102
Taylor, D. S., ferrohæmoglobin, 3401
Taylor, G. I., half-pitot tube, 2702; turbulence, 953, 1433*; viscosity of liquids, 90; vorticity, 50
Taylor, H. O., sound absorption, 2537
Taylor, H. S., adsorption of H_2 by Cu, 2297; diffusion, 2689; photochemistry, 4485; photolysis of acetone, 1612; ultracentrifuge, 1785*
Taylor, J. K., Ag-AgCl electrode, 2994; refractive index of water, 2014
Taylor, K., heats of solution of CaO and MgO, 3773
Taylor, L. S., X-ray intensity, 3756
Taylor, N. W., diffusion through pyrex glass, 4769
Taylor, R. L., sorption of water by rubber, 2300
Taylor, T. I., Li and K isotopes, 3439
Taylor, W. G. A., atmospheric telephotometer, 570
Tchakirian, A., elements in sea water, 1540
Tchang Yong-Li, potential function of $C_2HxDy(x+y=4)$, 2468
Tcharnyi, I., surges in pipes, 3932
Tcheng Mao-Lin, Algol minima, 531
Teare, B. R., electrical studies of living tissue, 1745
Teare, J., density of HCl solutions, 2687
Teichmann, H., photo-effect of Cs_2O, 1350
Teissié-Solier, M., vortices, 2265
Teller, E., atomic nucleus, 2644; electrical breakdown in crystals, 4656; multimolecular layers, 1479; nuclear α-particle model, 4735; nuclear forces, 2645
Teltow, J., spectrum of MnO_4 ions, 4537
Temple, G., relativistic optics, 4350
Tenani, M., marine current meter, 1076
Teorell, T., electrocapillarity, 2745; monolayers, 4774; surface pH, 2744
Terada, T., h.f. current in photo-cell, 3876
Terenin, A., quenching of fluorescence, 161
Terrien, J., optical study of cuprous halides, 2471
Tertsch, H., axes of symmetry, 28, 4756; indexing of crystal faces, 2234
Teunissen, P., paramagnetism, 3403, 4244, 5060
Thackeray, A. D., emission lines in late-type variables, 533; solar eruptions, 3600
Thams, C., albedo of snow, 4032
Thatcher, E. M., monofilms of barium stearate, 2742
Thein, L. P., photoelectric sensitisation of Al, 1757
Theobald, H., chemical activity of ions, 2920
Théodoresco, M., Raman spectra of molybdates, 4964
Thévenet, S., viscosity of As_2S_3 solutions, 13; viscosity of $Fe(OH)_3$ sol., 3446
Thibaud, J., disintegration of Po, 1121; excitation of N, 3632, 4055
Thibodeau, W. E., stresses in rubber, 1815
Thieme, E., effect of h.f. sound on polymers, 2221
Thiessen, P. A., crystallisation of rubber, 3454, 4291
Thoma, A., dielectric constant of an electron stream, 3797
Thomas, C. D., allotropy of P., 4742; interaction of particles, 3958; structure of liquid K, 3484
Thomas, C. L., hydrocarbon research, 261
Thomas, H. A., radio balloons, 3615
Thomas, L. H., cyclotron, 4901
Thomas, M. K., conductivity of KCl solutions, 1289
Thompson, H. W., photochemistry of alkyl nitrites, 171
Thompson, J. L., cosmic-rays, 3662
Thompson, J. W., structures of CF_4 and SiF_4, 3891
Thompson, N., Hall effect in Bi alloys, 1321
Thompson, T. G., conductance of KCl solution, 309
Thomsen, I. L., sunspots, 2779
Thomson, G., dielectric polarisation, 2570
Thornhill, R. S., rusting of Fe, 2992
Thornton, R. L., Sc isotopes, 2826
Thosar, B. V., fluorescent Cr^{+++}, 4090, 4914; Raman spectra of diacylamines, 728; Raman spectra of silicates, 4149
Thouless, R. H., visual perception, 4566
Thys, L., sound absorption in O_2, 2106; velocity of sound in H_2, D_2, He and Ne, 5010; velocity of sound in NO, 3332
v. Thyssen, S., seismic-electric effect, 3180; Thyssen gravimeter, 3072
Tibbs, S. R., energy bands in Cu and Ag, 927
Tibilov, S., night sky, 4040
Tien Kiu, atmospheric absorption, 1553, 4041; photographic sensitisation, 174
Tiercy, G., stellar temperatures, 3996; wind velocity, 2796
Tillotson, E., earthquakes, 1938
Tillyer, E. D., optics and glass industry, 1174
Tilton, L. W., refractive index of water, 2014
Timoféeff-Ressovsky, N. W., neutron irradiation, 3414
Timofeev, P., secondary emission, 3005, 3006
Timoshenko, G., ion source, 3349

Tingwaldt, C., infra-red absorption of CO_2, 1192 ; thermal measurements, 1245

Titani, T., diffusion of $H_2^2O^{17}$ in gelatin, 4313 ; isotopic ratio in water, 3490, 3491

Titeica, S., range of corpuscular rays, 606

Todd, E. E., adsorption of polar molecules, 4816

Toennies, J. F., differential amplifier, 2133

Tønsberg, E., aurora, 121, 2372

Tohmfor, G., condensation nuclei, 5003

Tokarew, N. W., ignition of NH_3 and N_2-H_2, 1247

Tol, T., electron diffraction patterns, 3837

Tolansky, S., nuclear moment of Cu, 4121 ; nuclear spin of I, 4521

Tollenaar, D., transformation of ND_4Br, 4309

Tollert, H., viscosity of electrolytes, 94

Tollmien, W., stream impulse, 3082

Tomboulian, D. H., hyperfine structure of In, 4520; NaIII spectrum, 4117 ; RbIII and SrIV spectra, 4118

Tomlinson, G. A., mechanical and thermal instruments, 1675

Tomonaga, S., neutrino-neutron collision, 630

Tomotika, S., sphere in stream, 2699 ; turbulence, 955, 956, 4327 ; vortices, 3929

Tongberg, C. O., freezing point apparatus, 766

Tonks, L., vaporisation of Hg kathode, 5023

Tonnelat-Baudot, M.A., field theory, 982 ; propagation of photons, 3659

Toomin, H., time and speed measurements, 501

Toral, T., density of SO_2, 3064

Toussaint, A., flow in conduits, 3514

Toussaint, R., artificial daylight, 4904

Townend, D. T. A., spontaneous ignition fuels, 1680

Townsend, A. A., production of γ-rays by neutrons, 1583, 2829

Townsend, J. S., electron diffusion, 1730; theory of electrical discharges, 4190

Trabert, E., photographic developers, 172

Traenkle, C. A., aerial photography, 3227

Trapeznikov, A. A., adsorption layers, 1493, 3556, 3557

Traube, I., critical temperature, 4594

Trautteur, P., association, 10 ; electric moments of alkali halides, 2986 ; frequency of diatomic molecules, 219; spectra of Hg, Cd and Zn halides, 697

Trautz, M., molecular theory of gases, 4994

Travis, I., mechanical solution of equations, 466

Treloar, L. R. G., secondary emission, 3839

Tremblot, R., 52 and 58 Persei, 1920 ; 59 Serpentis, 4403

Trendelenburg, F., church organ, 1255 ; vowel sounds, 1698

Trendelenburg, W., action of glottis, 2963 ; singing register, 3794 ; vowel sounds, 1698

Treu, M., galena light detector, 2196

Trey, F., cloud chamber, 2407

Trieschmann, H. G., liquid state, 2247 ; solubility, 2292

Trillat, J. J., electron beam, 2598 ; electron diffraction apparatus, 346 ; interfacial tension, 3978 ; internal potential of crystals, 2685 ; lubrication, 1869 ; structure of S, 934

Trimble, F. H., atomic distribution in liquid Na, 1409

Tritton, F. J., screen direction indicator, 1160

Trivelli, A. P. H., photographic emulsions, 3682 ; photographic gelatin, 3681

Troelstra, S. A., electrodialysis, 3900

Trombe, F., free radical of new type, 2171

Tronstad, L., densities of D_2O and H_2O, 3489

Truchet, R., valencies of C, 400

Trueblood, H. C., X-ray scattering in N_2, 4971

Trumpler, R. J., opposition of Eros, 518

Tsaï, B., magnetic field measurement, 2625, susceptibility of MnO, 4694 ; susceptibility of NO, 3022

Tschulanowsky, W. M., electronic shells, 1767

Tsuboi, C., earth's crust, 3505 ; subterranean structure, 4023, 4024

Tsuchida, R., polarimetry, 2874 ; spectra of coordination compounds, 3268, 3720, 4132, 4533

Tsumaki, T., spectra of coordination compounds, 4533

Tuckerman, L. B., thermoelectric power of Rh, 3881

Tulipano, P., vibration of C-H linkage, 2891

Tunell, G., optical indicatrix, 4113

Tunitzky, N. N., degenerate gas, 66

Turetschek, G., pendulum, 2313

Turnbull, J. C., electron scattering, 4672

Turner, H. J. A., electric discharge lamps, 2871

Turney, G. L., magnetometer, 5064

Turton, F. J., theorem of three moments, 2693

Tuttle, C., photographic exposure, 1161

Tuve, M. A., proton scattering, 1311

Twarowska, B., fluorene spectrum 3261 ; fluorescence of $C_{24}H_{16}$, 158

Tyler, E., surface tension, 4820

Tyrén, F., $K\alpha_{12}$, line of Al, 4161 ; L-series of 32 Ge to 19 K, 1228

Tyrrell, W. A., Jr., α-ray theory, 4457

Tyson, J. T., surface structure of Hg, 83
Tyte, L. C., viscous flow of metals, 950

Ubbelohde, A. R., Nernst heat theorem, 4174; resorcinol, 3061; thermal properties of long-chain compounds, 1251
Uber, F. M., quartz monochromator, 2636
Uémura, T., halochromism, 4532
Uffelmann, F. L., thyratron counter, 3205
Ufford, C. W., term values in C, 2030
Uhlenbeck, G. E., condensation, 2512; nuclear isomers, 3044; quantum theory of non-ideal gas, 258
Uhler, H. S., basic constants, 1447
Uhlig, H. H., solubility and surface tension, 983
Ukholin, S. A., CH_3OH spectrum, 209; H_2O spectrum, 210
Ulmann, M., soap solution, 2663
Umeda, K., β-decay, 1579; energy levels, 1759; nuclear excitation, 4053
Umemoto, Y., micro-crystals in Al wire, 1398
Umstätter, H., viscous elastic continua, 3936
Underwood, N., optical activity of $NiSO_4$, α-$6H_2O$, 4074, 4107
Ungar, G., nematic layers, 4764; photodichroism, 1625; photographic blackening, 3687
Uno, T., 3-body problem, 3133
Urbain, G., report of Committee on Atoms, 394
Urban, P., eigenvalues, 3531
Urey, H. C., Li and K isotopes, 3439
van Urk, A. T., cohesive forces of liquids, 498
Usher, F. L., Au sols, 4283
Utiyama, T., tungsten fuses, 4734
Utsugi, M., land and sea breezes, 566
Utterback, C. L., submarine photometer, 1930
Uyeda, R., inner potentials of graphite and molybdenite, 3001; structure of surface films, 4361

Vaidya, W. M., spectra of aliphatic halides, 3254
Vaidyanathan, P. S., spreading of substances on water, 2309
Vajifdar, M. B., viscosity of air, 4376
Valadares, M., Lα satellites of 82 (Pb), 2059
Valasek, J., energy bands in KCl and NaCl, 1669
Valberg, P., TlH spectrum, 2043
Valentiner, S., froth flotation, 2312; surface tension of aqueous alcohol, 992
Valette, S., photographic development, 4100
Valkó, A., cosmic rays, 1137
Vance, J. E., Raman spectra of H_2S and D_2S, 3739
Vanoni, E. P., units and precautions in radiology, 1344
Varadanam, C. I., SnO_2 sols, 3049
Varney, R. N., positive ion detector, 2550
Vashakidse, M. A., distribution of F-stars, 4399, 4400
Vassy, A., atmospheric light absorption, 3621; light absorption by O_3, 3656
Vassy, E., atmospheric light absorption, 3621; atmospheric O_3, 558; sol→gel transformations, 3447
Vaudet, M., luminous source, 2860
Vaughan, W., comparison of r.f. capacities, 5043
Vegard, L., aurora, 121, 2372, 4434, 4435, 4864
Veil, S., Ag-Ni and Ag-Pt cells, 3372; Cu-$CuSO_4$-Pt cell, 1299
Veimo, R., thermal data of vanadium oxytrichloride, 765
Veingerov, M., Tyndall-Röntgen effect, 4575
Veith, H., molecular heat of CH_4, 1233
Veksler, V., cosmic rays, 633, 634, 4079
Veldkamp, J., induced radioactivity, 1953
Vencov, S., $SOCl_2$ spectrum, 3711
Venkatarayudu, T., molecular vibrations, 4552, 4553, 4554
Venkateswaran, C. S., astronomical drive, 3573; Raman spectra of acids and acid salts, 1659; spherometer, 4334
Venturelli, L., interior of a liquid mass, 2750
Vercilli, F., oscillations, 1448
Vergnano, A. M., stellar motions, 3144
Verleger, H., canal rays, 203, 2461, 3735; CH_3F spectrum, 207
Verlende, E., surface conductivity, 4636
Verma, M. V., dielectric constant of space containing electrons, 313
Vernon, A. A., vapour pressure of WCl_6, 269
Vernon, E. L., molecular potential curves, 4961
Vernotte, P., heat flow, 2066, 2067, 2927, 3758; Rayleigh's criterion, 1239; thermal conductivity of metals, 2500
Véronnet, A., atomic nuclei, 3433; theory of radioactivity, 4054
Verschaffelt, J. E., thermostatic equilibrium, 3317
Vestine, E. H., earth's magnetism, 4444
Vészi, G., Tl and Cd atomic rays, 1443
Viehfeger, F., α-particles in He, 607
Vigness, I., effect of radiation on oils, 4973
Viktorin, O., radioactive Co, 4883
Villey, J., compressibility of liquids, 1810
Vinal, G. W., Weston standard cells, 2589

Vine, H., dipole moments of diazoamino-compounds, 830
Vinzelberg, B., cosmic rays, 1595
Virgitti, J., h.v. production, 2975
Visser, S. W., earthquakes, 1096
van Vleck, J. H., ferromagnetic crystals, 880; ferromagnetism, 1734; magnetic cooling, 1333
Vodar, B., Raman spectrum of HCl, 4550
Vogel, A. I., cyclic hydrocarbons, 4366
Voglis, G. M., currents in dielectrics, 3365
Vogt, A., polarisation of Ni anode, 3378
Vogt, E., solutions of Na in NH_3, 1332
Vogt, W., levers, 4784
Voinovsky-Krieger, S., stability of elliptic plate, 447
Volkovisky, V., transport of ions in gas, 2542
Volmer, M., condensation nuclei, 5003
Vorobeitchik, J., heterochromatic photometry, 669
de Vries, H., induced radioactivity, 1953

Waetzmann, E., undertones, 2528
Wagener, S., contact potential, 4684; oxide kathodes, 4732
Wagman, N. E., Ca spectrum, 2448
Wagner, A., air temperature, 1081
Wagner, C., conductivity of Cu_2O, 3359; diffusion in mixed crystals, 944; ionic conduction in solid salts, 1285; ions in solids, 3825
Wagner, G., structure of $BrC(CN)_3$, 4302
Wagner, J., Raman effect of ethyl derivatives, 4556; Raman effect of methyl derivatives, 2913
Wagner, K. W., coupled oscillations, 2698
Wagner, P., thermomagnetic effect in Ni, 4687
Wahlin, H. B., thermionic emission from Rh, 4582
Wait, G. R., air potential gradient, 578
Wakeham, H. R. R., monomolecular film, 3121
Wakesima, H., OH bands, 3265
Walcher, W., impact of Cs ions on W, 4267; Rb isotopes, 397, 1763
Wald, G., visual adaptation, 741; visual threshold, 2053
Wald, M., activity coefficients, 853
Waldmann, L., equation of state, 777
Waldmeier, M., coronal lines, 1068; ionosphere, 372; solar prominences, 2777, 4410
Walerstein, I., cyclotron, 1733
Walker, A. E., cerebello-cerebral relationships, 2180
Walker, G. T., anemoclinometer, 4871
Walker, J. W., PbSe, SnSe and PbTe spectra, 714
Walker, P. A., micro-conductivity apparatus, 4208
Walker, R. D., decahydronaphthalene, 4580
Wall, F. T., vibrations of methylacetylene and ethane, 1212
Wallenquist, Å., ρ Ophiuchi, 1022; stellar distribution, 1049
Waller, M. D., vibrations of circular plates, 273
Walsh, J. W. T., photometry of projectors, 2436*
Walter, B., thunder clouds, 1104
Walter, K., tidal deformation of stars, 3155; U Sagittae, 4004
Walther, H., NaCl single crystals, 35
Walti, A., elastic constants of solids, 1813
Walton, H. F., electrolytic separation of D_2, 1724; microthermal conductivity apparatus, 1373
Wambacher, H., cosmic rays, 2848, 2849; range of H-rays, 618
Wang, J. S., adsorption kinetics, 3547; adsorption theory, 2298; superlattices, 4294
Wang, P., neutron bombardment of Al, 4678
Wannow, H. A., turbidity of As_2S_3 sols, 3050
Warburton, F. L., unit, 5073
Ward, A. L., properties of hydrocarbons, 4931; refractivity intercept, 193, 679
Ward, W. H., electrobiology, 1340
Wardlaw, W., valency of Ru, 4276
Warfield, C. N., tricolour mixing device, 4466
Waring, C. E., diffusion of Li Ions, 40
Warren, B. E., particle size, 3458; structure of U, 422; structure of water, 4763
Warren, D. T., nuclear calculations, 2
Wasastjerna, J. A., atoms and ions, 1786
Washburn, E. R., monomolecular films, 3121; transition of Na_2SO_4, $7H_2O$, 2505
Wasserfall, K. F., magnetic pole, 4879
Wassermann, A., reaction kinetics, 786
Wassmuth, N., Brownian movement, 961; night sky, 4040
Wataghin, G., elementary particles, 2283; explosion waves, 4170; gravitational equations, 2290; neutrinos, 1977; relativity transformations, 4349
Watanabé, T., structure of $C(CH_2OH_4)$, 1792
Waters, G. W., conductance of HCl in dioxane, 5034
Watson, B. B., X-ray spectrograph, 751
Watson, F., Jr., meteors, 1014
Watson, F. R., ripple tank photography, 2540
Watson, H. B., reaction kinetics, 786
Watson, K. M., properties of hydrocarbon mixtures, 788
Watson, N. A., limits of audition, 2104

Watson, W. H., electromagnetic field specifications, 1740
Watson, W. W., CeO and PrO spectra, 2046 ; LuO spectrum, 1209
Watts, S. S., vacuum spectrograph, 4975
Watzel, R., solutions of noble gases, 2728
Wavre, R., equilibrium of fluid masses, 4383
Wawilow, S. I., fluorescence depolarisation, 162, 163 ; interference phenomena, 1133
Weatherwax, J. L., characteristics of X-rays, 4717
Webb, J. H., latent image, 3688
Webb, R., solubilities of hexanols, 3107
Weber, A. H., evaporated Bi films, 3421
Weber, C. G., ozaphane films, 4490
Weber, S., equilibrium in gases, 1441 ; thermo-molecular pressure, 1438, 1439, 1440
Webster, D. C., heat capacities of hydrocarbons, 243
Webster, J. H. D., wave-length in radiotherapy, 1750
Webster, S. B., Hg arcs, 4515
Wefelmeier, W., atomic nucleus, 1
Weghofer, H., heats of sublimation, 2510
Wehner, E., system Cu-Cu_2O-Cu, 3358
Wehrheim, W., X-ray ionisation measurements, 2062
Wehrle, P., equations of hydrodynamics, 2264 ; turbulence, 3510
Wehrli, M., spectra of Hg halides, 3263
Weichardt, H., electron lens, 4682
Weichherz, J., thermal expansion of liquids, 3303
Weigand, K., transformation of H_2S and D_2S, 4173
Weigert, photochemical processes, 3678*
Weigert, F., photographic emulsions, 3685
Weigle, J., light propagation, 1976, 2846 ; X-ray reflection in crystals, 746
Weinblum, G., sea disturbance, 2788
Weinmann, E., Rutherford scattering, 4674
Weiser, H. B., coagulation, 1778 ; ferrocyanide gels, 4752
Weiss, J., fluorescence of U salts, 1601; photosensitisation, 3684*; reaction kinetics, 786
Weizel, W., purification of inert gases and H_2, 2556
Weizmann, A., dipole moments, 4213
v. Weizsäcker, C. F., nuclear models, 2205 ; stellar nuclear transformations 4845
Welford, G., buffer solutions, 846 ; calomel electrodes, 845
Welker, H., Kepler problem, 2715
Weller, R., Laplace's equation, 2703
Wellmann, P., stellar atmospheres, 1046
Wells, A. F., structure of Pd compounds, 3478 ; structure of trimethylstibine, dihalides, 3477
Wells, D. A., electrical circuits, 2966 ; Moseley law X-ray tube, 4572
Wells, H. W., ionosphere, 2192, 3420, 4725
Wells, L. S., heats of solution of CaO and MgO, 3773 ; transition of $CaSO_4$, 2939
Wells, W. H., high-energy particles, 4899
Wempe, J., stellar spectra, 4396
Wendling, A. V., structure of $Rb_2S_2O_6$, 2678
Weng Wen-Po, atomic forces in solids, 499 ; molecular forces, 4171 ; viscosity of gases, 2747
Wensel, H. T., thermoelectric power of Rh, 3881
Wenstrom, W. H., upper-wind observations, 1095
Wentzel, G., heavy electrons, 2647
Wenzke, H. H., dielectric properties of acetylenic compounds, 316, 4649
Werenskiold, W., aerological chart, 4429
Wernberg, G., meteor spectrum, 1011
Werzner, V., night sky, 4040
Wessel, W., electron spin, 4799
West, W., photodecomposition of CH_3I, 2427 ; vibration spectra and electric moments, 708
Westcott, C. H., slow neutrons, 2603
Westhaver, J. W., glow discharge, 290
Westheimer, F. H., dissociation constants, 4217
Westwood, J. V., anodic oxidation, 3828
Wever, E. G., electrical responses of the ear, 802
Weyl, H., symmetry, 3090
Weyn, C., polarity in electric arc, 1178
Weyssenhoff, J., field theory, 480
Whatman, A. B., high-latitude radio observations, 1755
Wheatcroft, E. L. E., amplifier, 4634 ; thermionic emission, 3427
Wheeler, A., adsorption of H_2 and D_2, 4819
Wheeler, J. A., atomic nucleus, 2644 ; light nuclei, 393 ; nuclear structure, 392 ; wave functions, 64
Wheland, G. W., electronic structure of molecules, 905
Whipple, F. J. W., atmospheric electricity, 2381 ; electric fields in clouds, 1103
Whipple, F. L., Nova Herculis, 1915 ; orbit of Apollo, 1029 ; photographic plates, 2000 ; planetary nebulæ, 2324 ; wood replica gratings, 2317
Whitaker, M. D., Geiger-Müller counter, 892
White, A. B., engine for smoothing wires, 4268
White, G. E., dew point, 2797
White, H. L., electrophoresis, 920
White, M. G., cyclotron, 617
White, P., electroosmosis, 3053
Whitehead, L. G., skin friction, 4781

Whitehead, R. W., polyelectrophysiograph, 4702
Whitfield, G. W., thixotropy, 1385
Whitford, A. E., solar corona, 1926; stellar magnitudes, 1897
Whitmore, E. J., crystal growth on calcite, 2248
Whitney, L. V., thermionic emission from Rh, 4582
Whitrow, G. J., linear equivalence, 2752; uniform time, 2321
Whittaker, J. M., shot effect, 3038
Wicke, E., adsorption by porous materials, 3970
Widdowson, E. E., continuous β-ray spectra, 1128
Wiebe, R., compressibilities of gases, 4998
Wiebenga, E. H., structure of $(HCNO)_3$, 2681
Wiemann, J., Raman effect of ZnI_2 and CdI_2 solutions, 1221
Wiersma, J. T., cosmic rays, 4476
Wigner, E., electrons in metals, 3804; nuclear forces, 3043; reaction kinetics, 786
van Wijk, W. R., viscosity of liquids, 92
Wild, G., fluorites, 2861
Wildt, R., planets, 2759
Wilhelm, J. O., refractive index of He, 4112; sound velocity in He, 4606; supraconductors, 1711, 5032
Wilhelmy, E., cosmic rays, 593; resonance emergence of protons, 602
Wilkins, F. J., adsorption of gases, 988, 989
Wilkinson, H., specific heat of Ni, 4164
Wilks, C. R., sound velocity in Bi, 2100
Willemsen, H., absorption of Ra γ-rays, 1582; γ-ray counter, 1129
Willett, H. C., weather forecasting, 562
Williams, A. S., Jupiter, 2327
Williams, D., liquid crystals, 3917; S-H frequency of mercaptans, 4527; structural theory, 4792
Williams, D. T., hyperfine structure of B Y, Rh and Pd, 4120
Williams, E. G., luminosity in B-stars, 2765; Nova Herculis, 4005
Williams, J. H., disintegration of Be, 140
Williams, J. W., dielectric constant and particle size, 832
Williams, N. H., ultra-short waves, 366
Williams, R. C., determination of e/m, 5049; fine structure of Hα and Dα, 4933
Williams, T. I., frequency of N-S link, 3278
Williams, W. E., Cd line 6438 Å, 4116
Williamson, C., tempered scale, 5021; triode voltmeter, 4631
Wilman, C. W., stereoscopic calculations, 1164
Wilson, A. H., conductivity of transition metals, 4206; H isotopes, 3437; superlattices, 420
Wilson, C. L., reaction kinetics, 786
Wilson, C. W., 4 gm. radium unit, 1342; 2-gm. Ra unit, 1753
Wilson, E. B., Jr., heat capacity of C_2H_6, 4976; infra-red spectrometer, 2052; mechanical analyser, 58; polarisation of Raman lines, 1662; spectra of cis- and trans-butene-2, 2463
Wilson, E. T., screen direction indicator, 1160
Wilson, J. G., cosmic rays, 1988, 2856
Wilson, O. C., interstellar lines, 525; radial velocities of stars, 3148
Wilson, R. R., cyclotron, 1964
Wilson, V. C., cosmic rays, 1597
Wilson, W., unit of electric charge, 2152
Winch, G. T., rectifier-photo-cells, 5079
Windebank, C. S., dilute suspensions, 2218
Winkel, A., Hg drop electrode, 1303, 3379; surface films, 4364
Winkler, O., Ni-Mo alloys, 3847
Winter, S., Geiger counter, 4064
Winter-Klein, N., refractive index of glass, 3700; strain in glass, 2261
Wintner, I. H., vapour pressures of alkali halides, 2952
Wirtz, K., condensed phases, 5000; H_2 overvoltage, 2588
Wischin, A., colloidal graphite, 4357
Wiseman, L. A., activity coefficients, 482
Wishart, A. W., sorption of Cl_2 by C, 3109
de Wiśniewski, F. J., nuclear structure, 3434; nuclear theory, 2650
Witchell, W. M., coil magnetometer, 3188
Witkowski, R., susceptibility of alloys, 4246
Witmer, F. P., catenary elements, 60
Wittke, H., magnetic after-effect, 1328; magnetisation, 1327
Wittstadt, W., crystallisation of rubber, 4291
Woinarosky, R., kinematics, 1833
Wojtaszak, I. A., deflection of plate, 446
Wolf, E., visual flicker, 739, 740, 2484, 3283, 3284
Wolf, F., charge of slow ions, 814; scattering of slow ions, 2548
Wolf, K. L., heats of combustion, 1676; heats of sublimation, 2510; intermolecular forces, 2524
Wolf, W., pyrophoric Fe, 2940
Wolfenden, J. H., electrolytic separation D_2, 1724
Wolfers, F., Mach effect, 1995
Wolff, H., excited centres in crystals, 4310
Wolfke, M., interaction between circuits, 2125; magnetostriction of O_2, 1337, 3858

Wollan, E. O., characteristic temperature of MgO, 3288; X-ray powder photographs, 2063
Woo Sho-Chow, u.v. bands of C_2H_2, 2452
Woo Ts-Ming, emulsification, 23
Wood, L. A., entropy of isoprene, 260; stresses in rubber, 1815
Wood, L. J., photosensitivity, 2869
Wood, R. W., H_2 arc spectrum, 699; N_2 bands, 4953; optical properties of metals, 4111
Wood, W. A., failure of metals, 3071; steel fracture, 1816; structure of mica, 246
Woodcock, A. H., gas thermometer, 4167
Woodhead, D. W., explosion waves, 772
Woods, H. J., structure of fibres, 2226
Woodward, I., structure of dibenzyl series, 937
Woodyard, O. C., microphotometer, 4103
Woolard, E. W., haloes, 569; weather, 1083
Wooldridge, D. E., C isotopes, 399
Woolley, R. v. d. R., absorption lines, 3590; double-star orbit, 2332; solar spectrum, 540
Workman, E. J., lightning, 1563
Worthing, A. G., optical constants, 4110
Wratten, I. D., kinematography, 2004
Wrenshall, C. L., colorimetry, 2413
Wright, B., stereoscopic calculations, 1164
Wright, C. E., rotating rope, 949
Wrinch, D. M., crystal analysis, 4757; proteins, 3895; structure of insulin, 4301
Wu Chih, u.v. bands of C_2H_2, 2452
Wu, C. K., CCl_4 spectrum, 1663
Wu Ta-You, Raman spectra of benzene derivatives, 729
Wulf, O. R., radio fade-outs, 4726
Wulf, R., infra-red absorption of organic molecules, 4952
Wulff, P., dielectric loss, 2577
Wurm, K., cometary spectra, 1885; emission lines in extended chromospheres, 527; outer shells of stars, 3150
Wwedensky, B., radio wave propagation, 369
Wyart, J., polymorphism in leucite, 429
Wyckoff, R. W. G., ultracentrifuge, 25
Wygasch, E., aerosols, 4744
Wyman, J., Jr., contact potentials of stearate films, 2743; dielectric constant of ω-hydroxydecanoic acid, 1716; dielectric constant of D_2O, 2985
Wynne-Jones, W. F. K., reaction kinetics, 786
Wyse, A. B., α Cygni, 4395

Xanthakis, J., Strasburg meridian, 1508

Yadoff, O., removal of charge by air, 1731
Yakovlev, P. A., acoustic stimulation of eye, 3751
Yamaguchi, B., viscosity of hydrocarbons, 1879
Yamaguti, S., earthquakes, 4049
Yamaguti, T., oxidation of Cu, 1863
Yamamori, S., electrolytic Pb, 4296
Yamamoto, G., dew, 567
Yamamoto, H., wave equations, 2284
Yamamoto, M., magnetostriction, 4700
Yamanouchi, T., atomic energies, 4122, 4522; ferromagnetism, 879; NiII spectrum, 2460
Yamasaki, K., ferromagnetic gels, 4285; spectra of $2,2^1$-dipyridyl complexes, 4534
Yano, K., unitary field theory, 479
Yarnold, G. D., ball supported by air-jet, 1818; Hg in capillary tube, 2746
Yates, E. L., separation of isotopes, 4273
Yeou Ta, spectra of cis- and trans-isomers, 4124; vibrations of organic molecules, 3251
Yoshimoto, S., electrolytic Pb, 4296
Yoshimura, H., glass electrode, 326
Yoshimura, S., thermal stratification of lakes, 548
Yoshinaga, H., u.v. bands of Li_2, Na_2 and K_2, 1203
Yosida, K., matrix groups, 3945
Yosioka, K., sound velocity in D_2O, 4184
Yost, D. M., OsO_4 in CCl_4, 3966; Raman spectrum of BF_3, 3738
Young, L., molecular rearrangement by h.f. sound, 3336
Young, R. T., Jr., daylight absorption in water, 1929
Young, R. W., stroboscope, 5017
Young, T. F., heat contents of salt solutions, 4986
Yuasa, T., SiF spectrum, 214
Yukawa, H., elementary particles, 1306, 3000
Yvon, J., magnetic electron, 972

Žáček, A., vibrations of quartz plates, 797
Zacharias, J. R., nuclear moments of In, 1644
Zachariasen, W. H., structure of $KH_2(H_3O)_2B_5O_{10}$, 426
Zahl, P. A., biological effects of X-rays, 4706; monofilms of barium stearate, 2742
Zahn, C. T., nuclear research apparatus, 616; specific charge of β-particles, 2591; variation of electron mass, 2592
Zamenhof, S., temperature and pressure measurement, 2933, 3770
Zamlyński, T., Cd spectrum, 3712
Zanaboni, O., elasticity equations, 3065; St. Venant's principle, 44

Zanko, A. A., spectra of D_2O solutions, 2464
Zanotelli, G., light vibrations in magnetic field, 1971
Zapf, G., solubility of gases in Fe, 4812
Zapffe, C. A., Fe-Pd alloys, 4760
Zavadovskaya, E. K., u.v. radiation of crystals, 3216
Zavelskij, A. S., β-spectra, 1577, 1578
Zeiller, O., cosmic rays, 1596; tube counters, 2838
Zeldowitsch, J. B., adsorption on uniform surface, 3112; explosion of N_2O, 4589; flame propagation, 4588
Zeleny, J., discharge in gases, 3799
Zellhoefer, G. F., solubility of haloforms, 3106
Zellner, C. N., chemiluminescence, 654
Zelmanov, I. L., liquefaction of He, 4177
Zemplén, J., dissociation energy of CN, 1649
Zener, C., internal friction in solids, 504, 505, 1881, 3127
Zenneck, J., upper atmosphere, 5075
Zernike, F., coherence, 3674; interference systems, 655
Zerrahn-Wolf, G., visual flicker, 739, 740, 2484, 3283, 3284
Zeuli, M., pendulum, 4341
Ziemecki, S., cosmic rays, 4082
Zimmer, K. G., neutron irradiation, 3414
Zinn, N., H_2-N_2-CO system, 789
Zirg, I., excitation of Hg atoms, 200, 820; Hg discharge, 2122
Zirkle, R. E., relative action of neutrons and X-rays, 2634
Zirkler, J., cosmic rays, 1135
Zlotowski, I., disintegration of B, 3638; helion-deuteron collisions, 2825; transmutation of B, 1952
Zmačinskij, E. W., potential at metal surfaces in solutions, 840, 841
Zmaczynski, A., boiling point of water, 787
Zocher, H., liquid crystals, 2245; nematic layers, 4764; Schiller layers, 1304
Zosimovich, D. P., galvanic cells, 4658
Zouckermann, R., sparking potential, 1268
Zuber, K., electron pairs, 3004; electron scattering in A, 3386; Wilson cloud chamber, 3206
Zuithoff, A. J., specfic heat of Fe, 2497
Zumwalt, L. R., infra-red band envelopes 4959
Zwetkoff, W. N., viscosity of *p*-azoxyanisole, 1880
Zwicky, F., supernovæ, 4847

PRINTED IN GREAT BRITAIN
BY SIMSON SHAND LTD.
LONDON AND HERTFORD